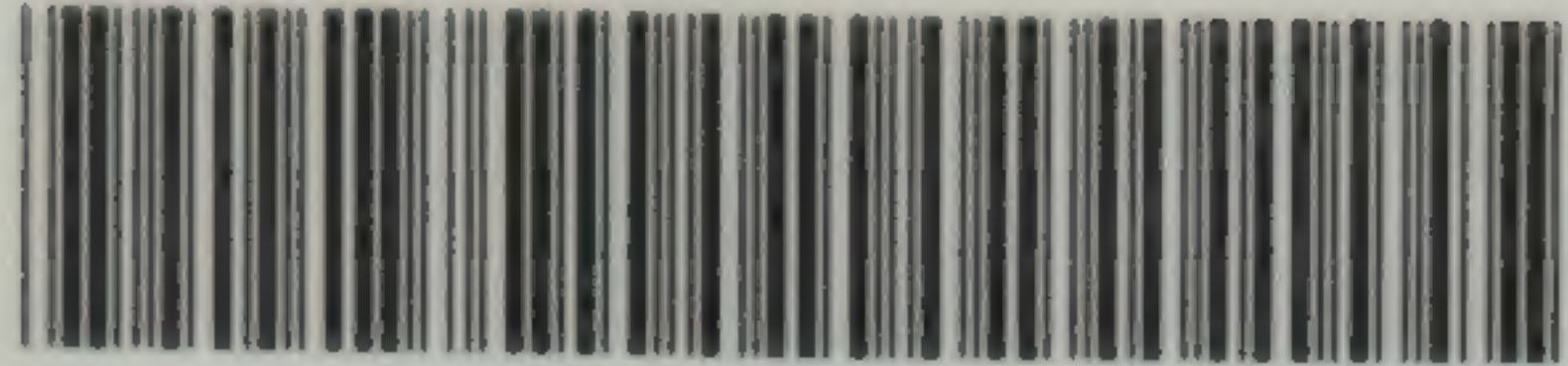


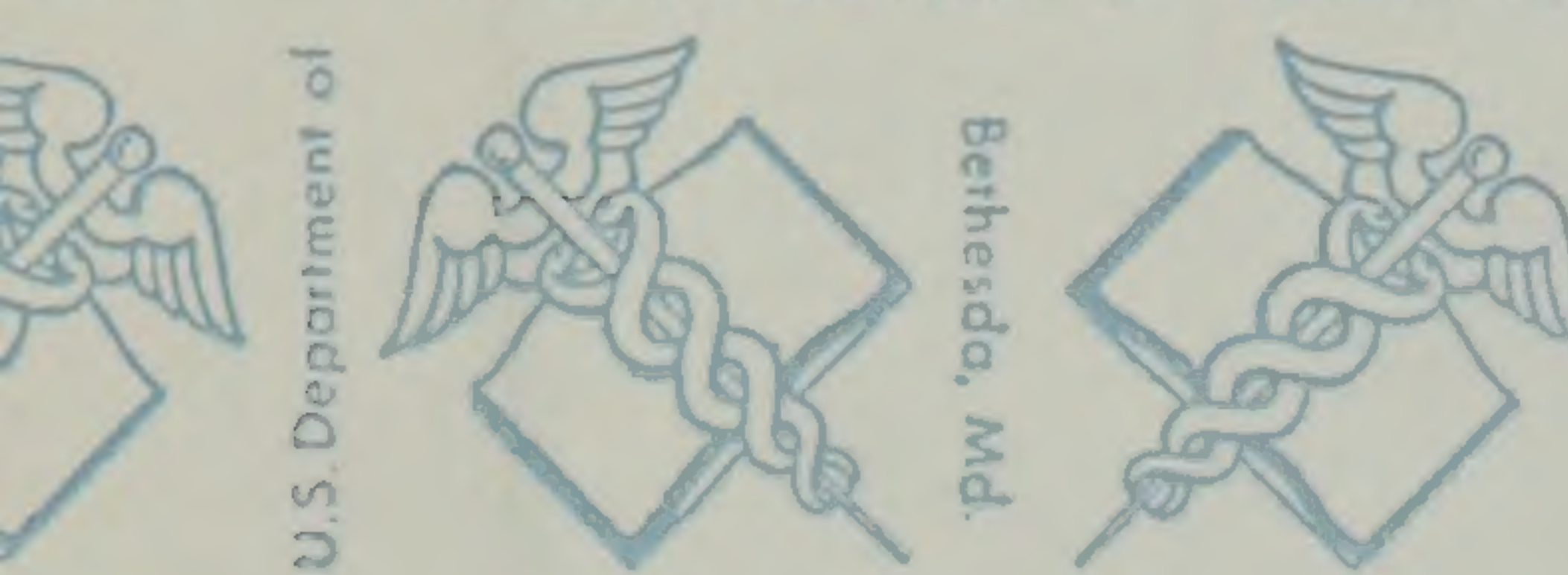
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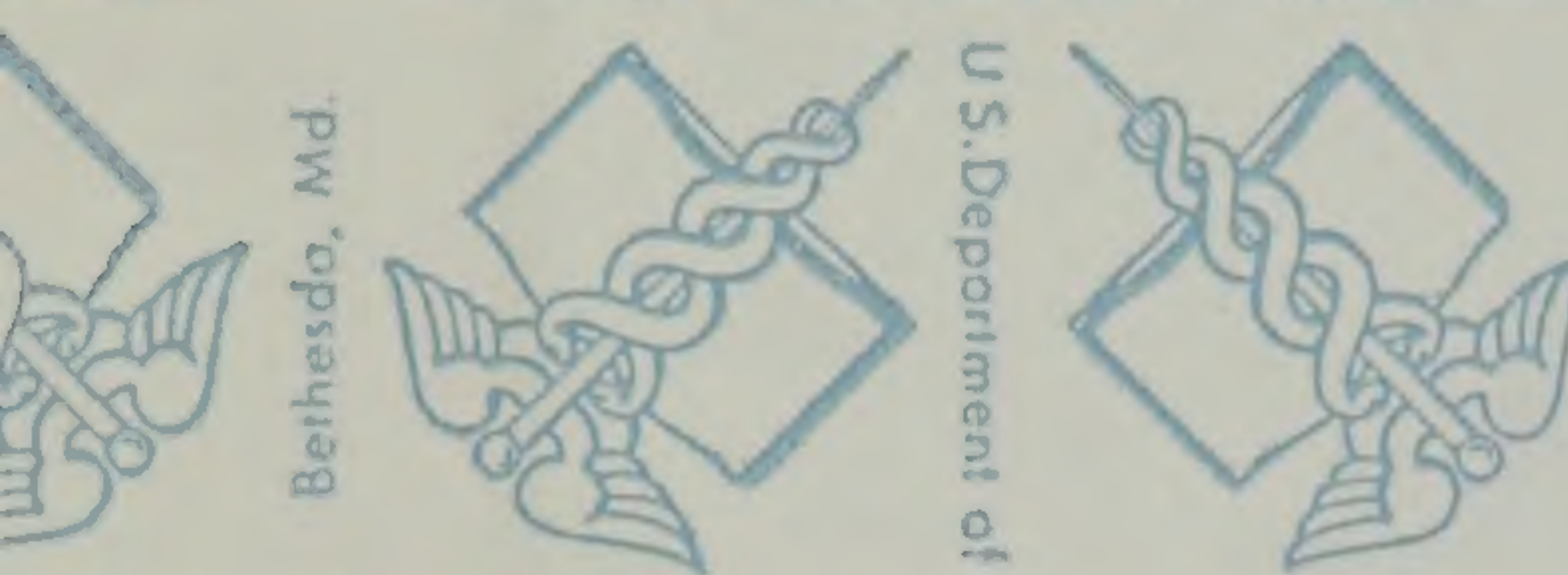
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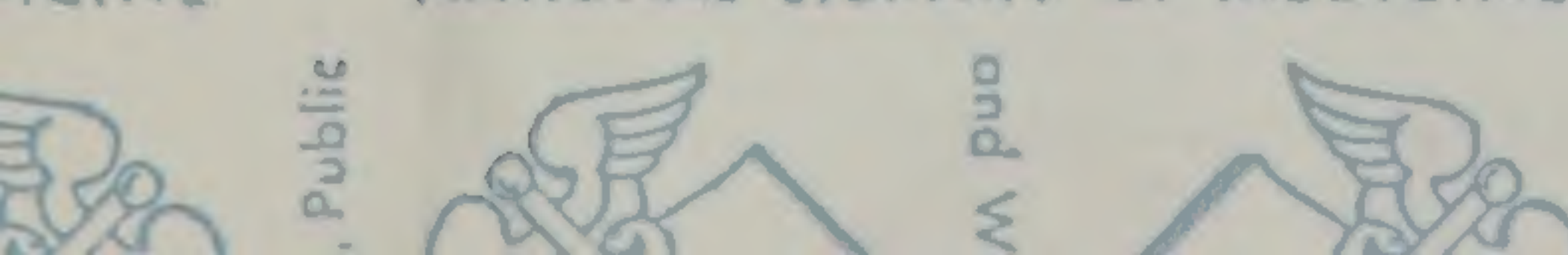
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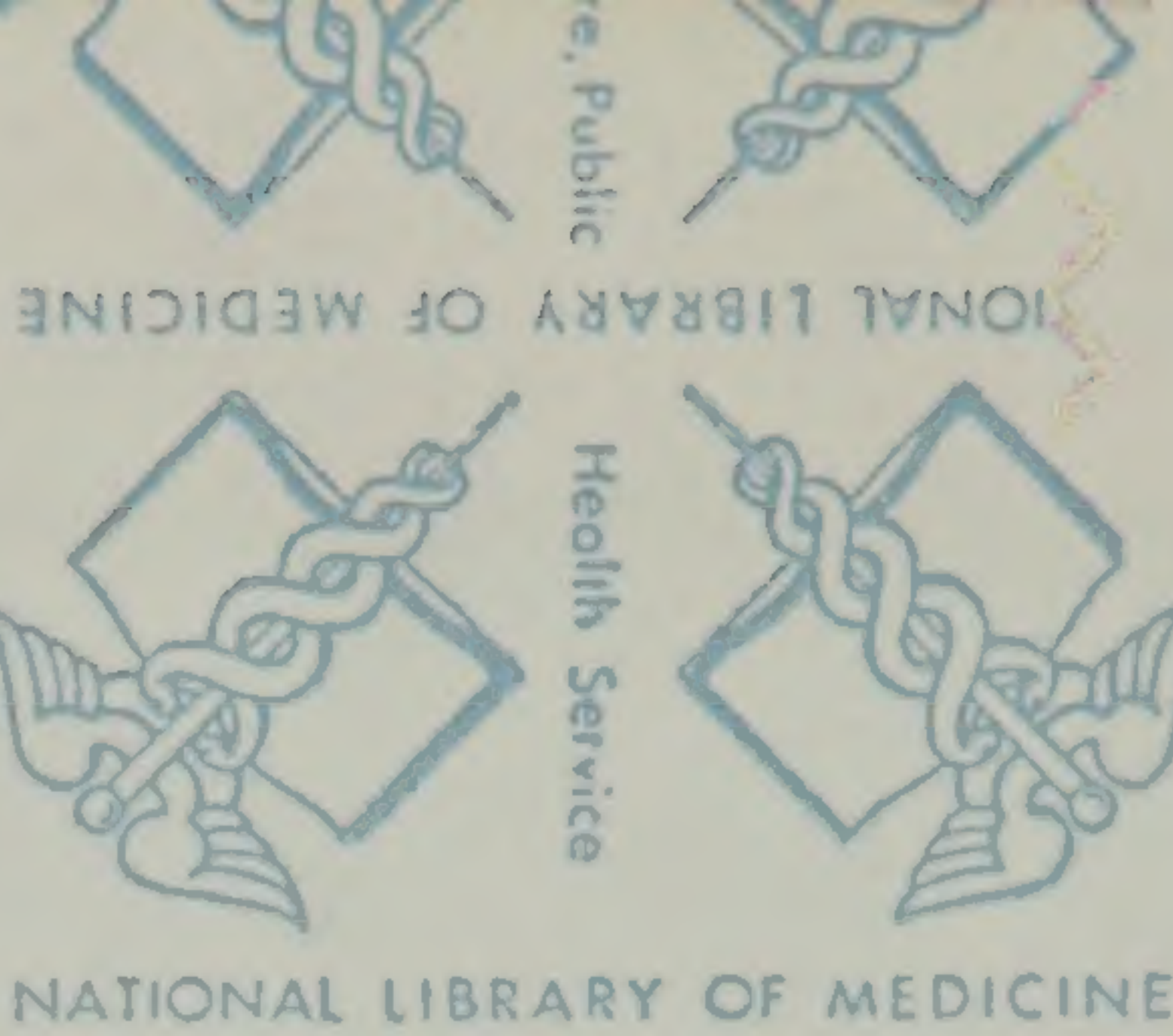
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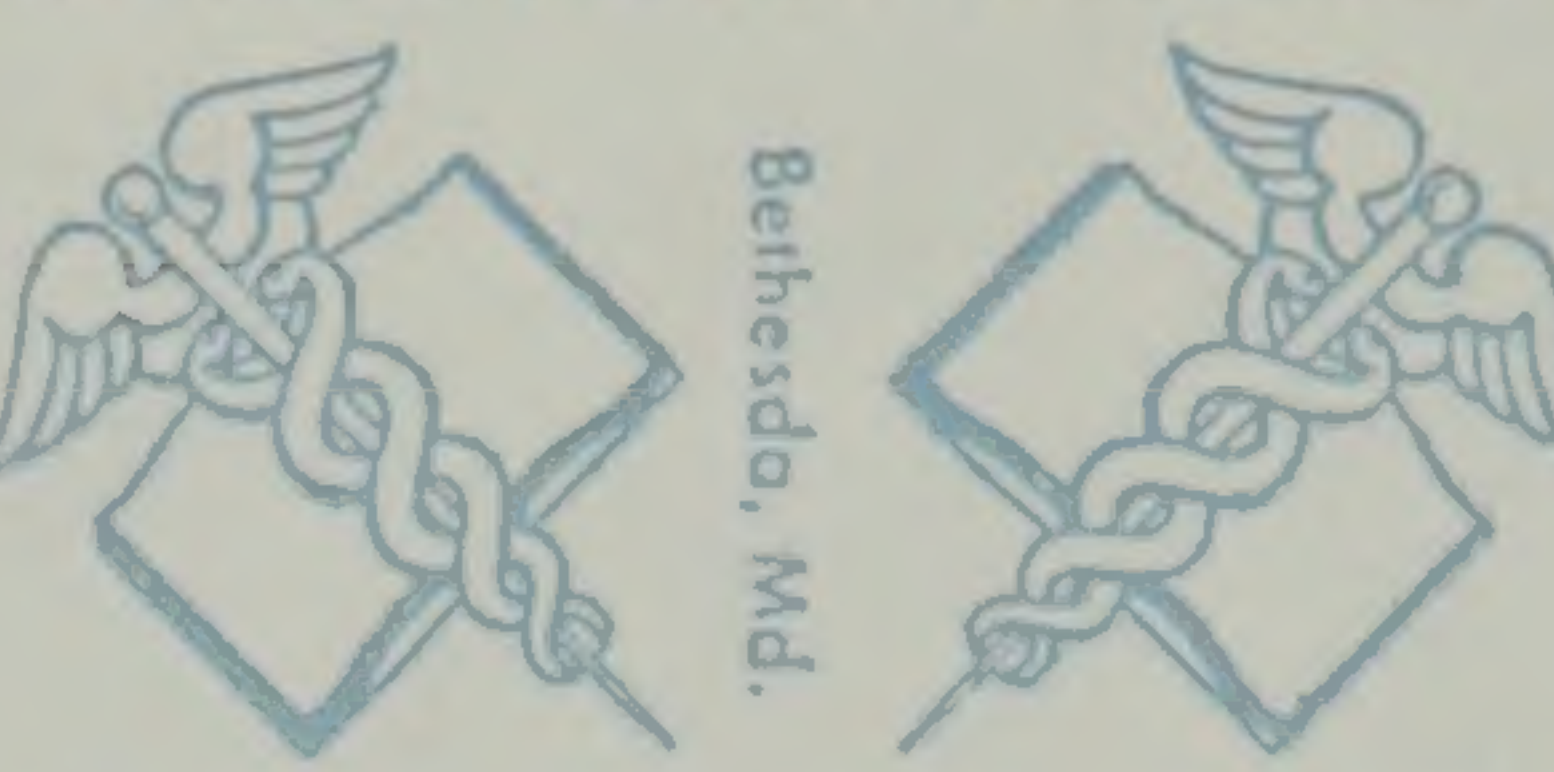
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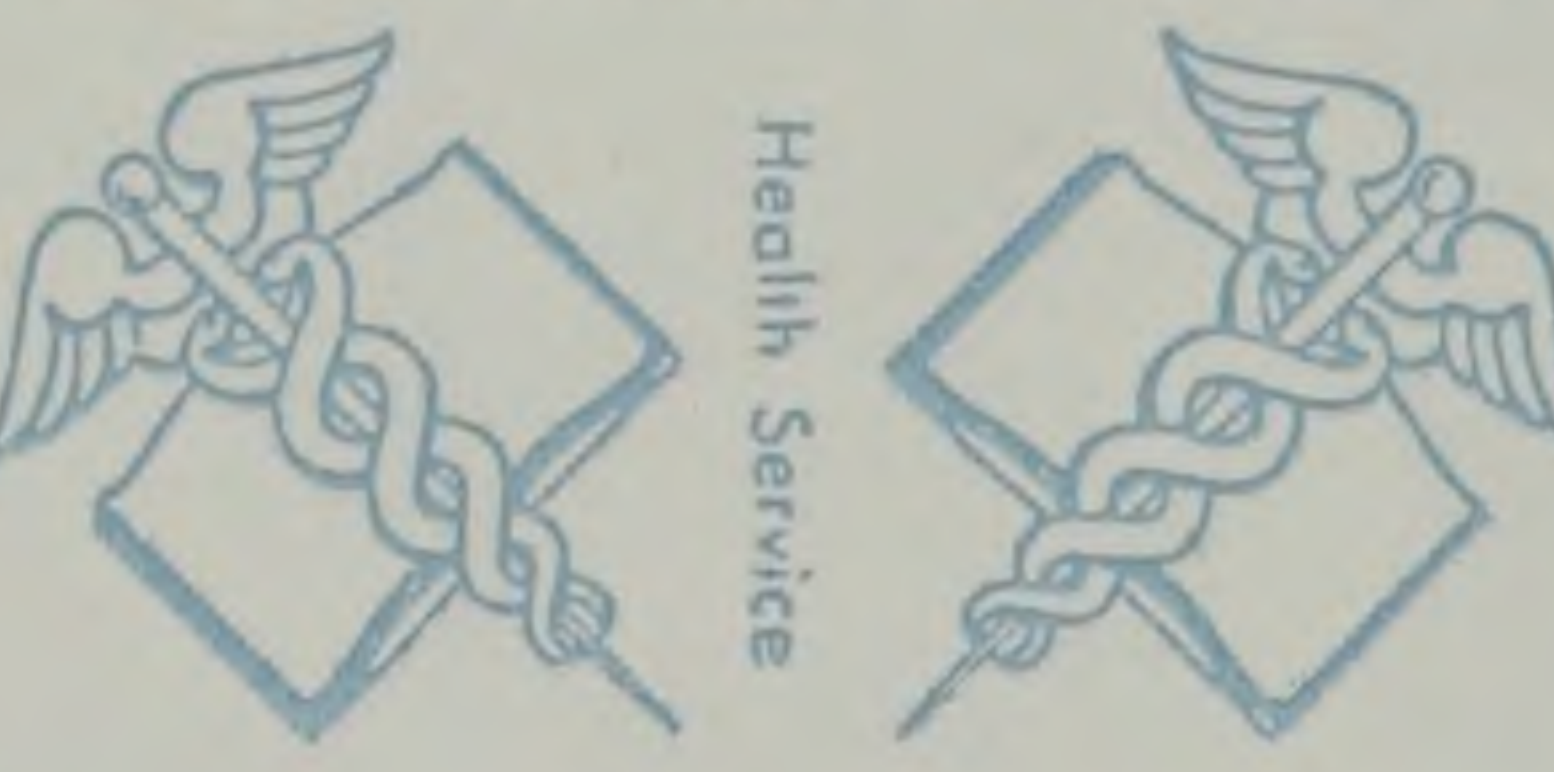
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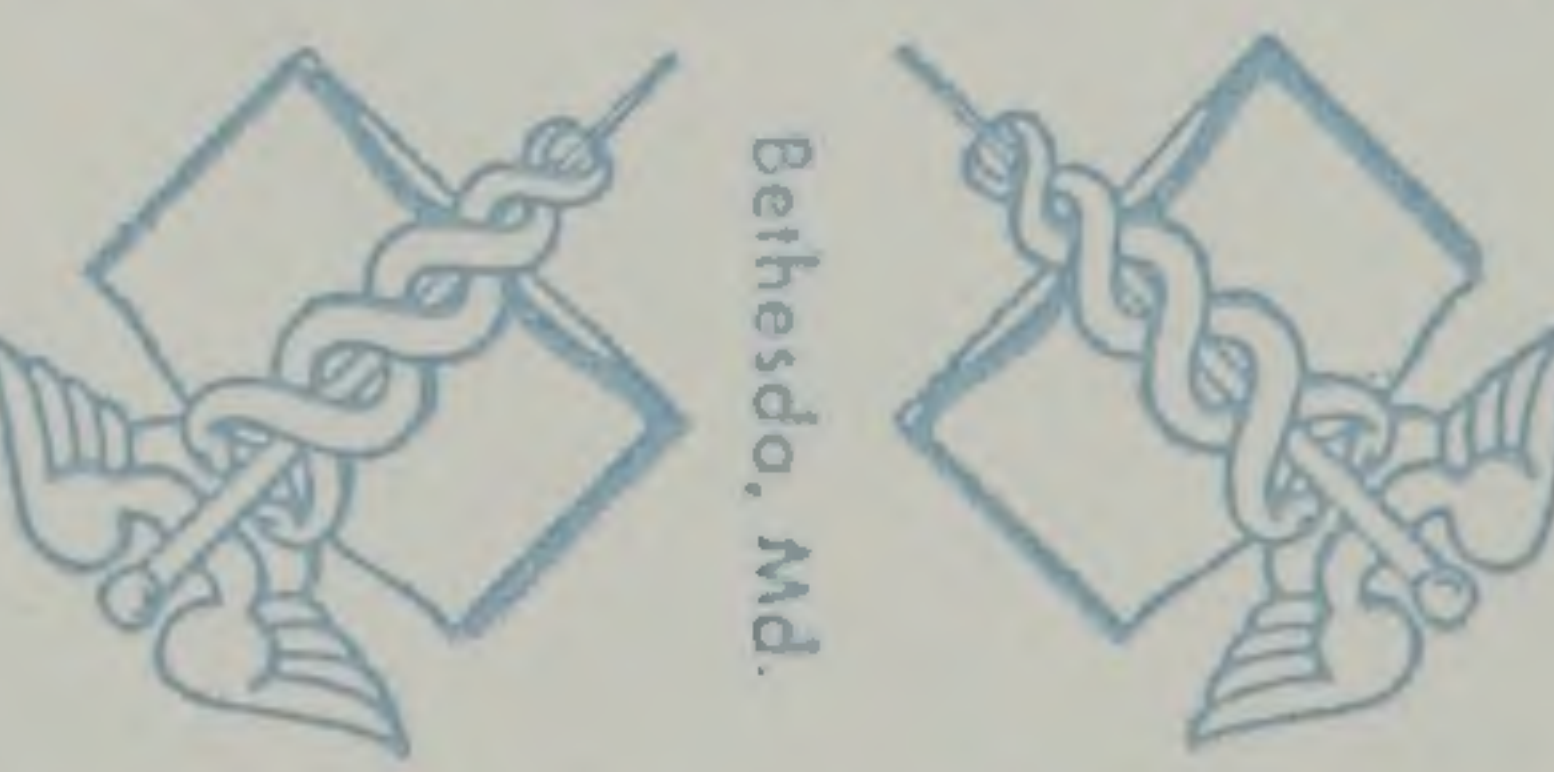
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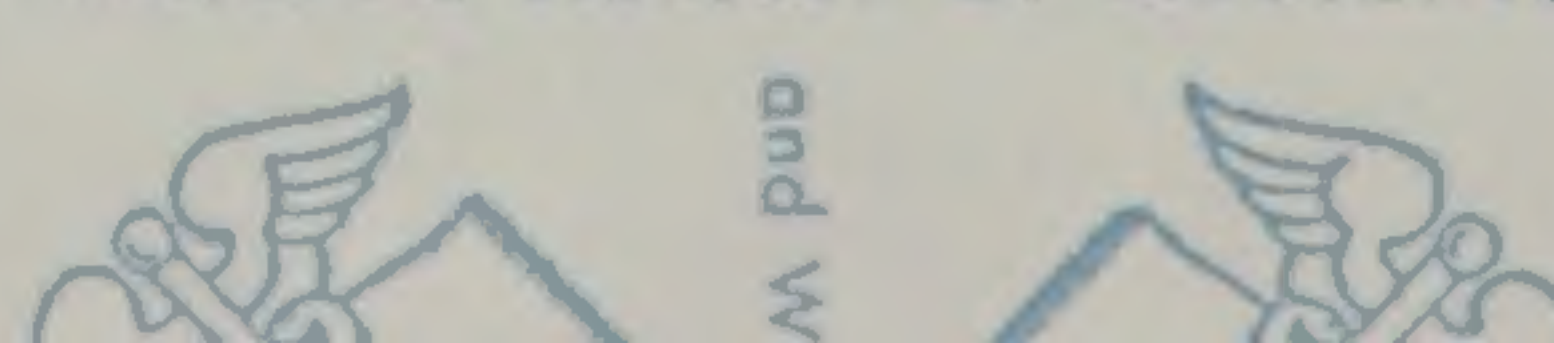
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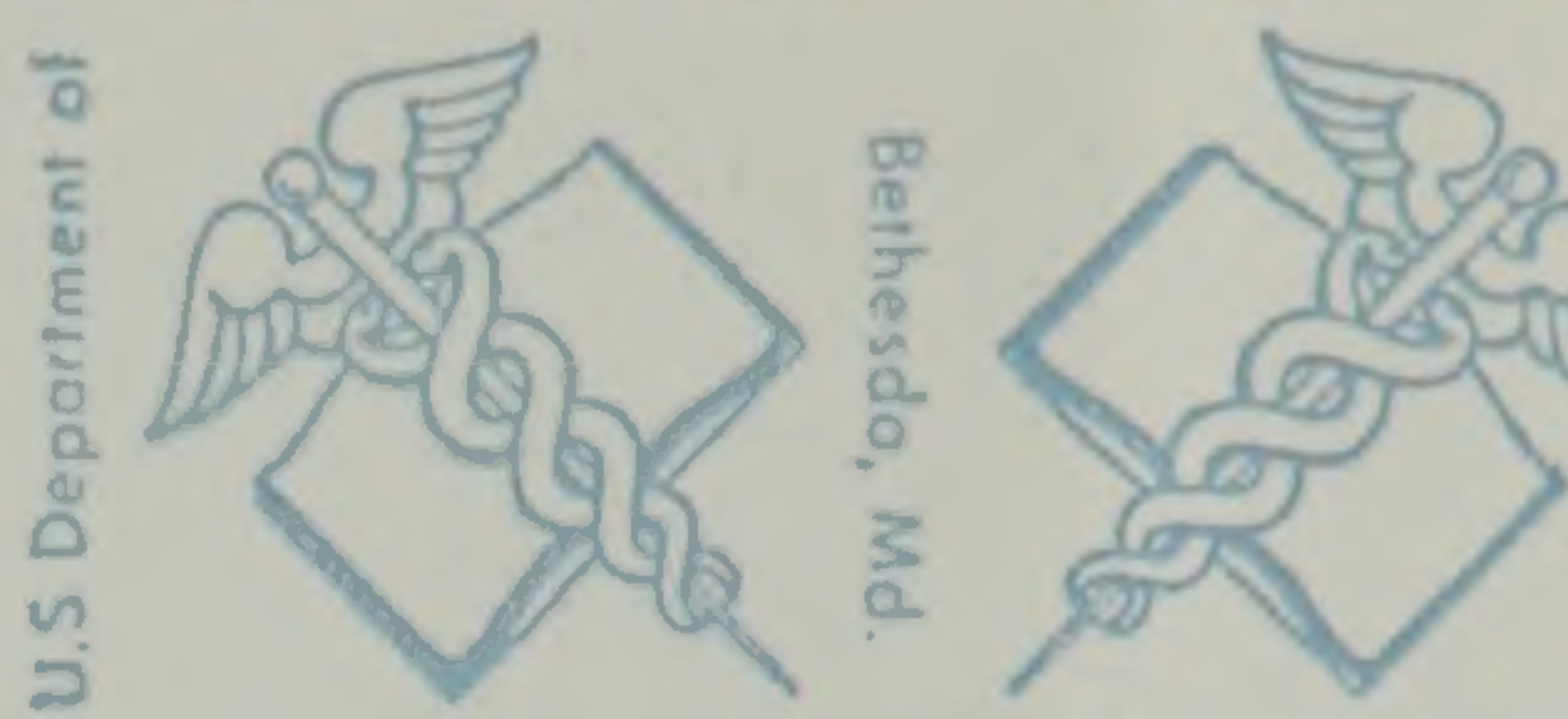
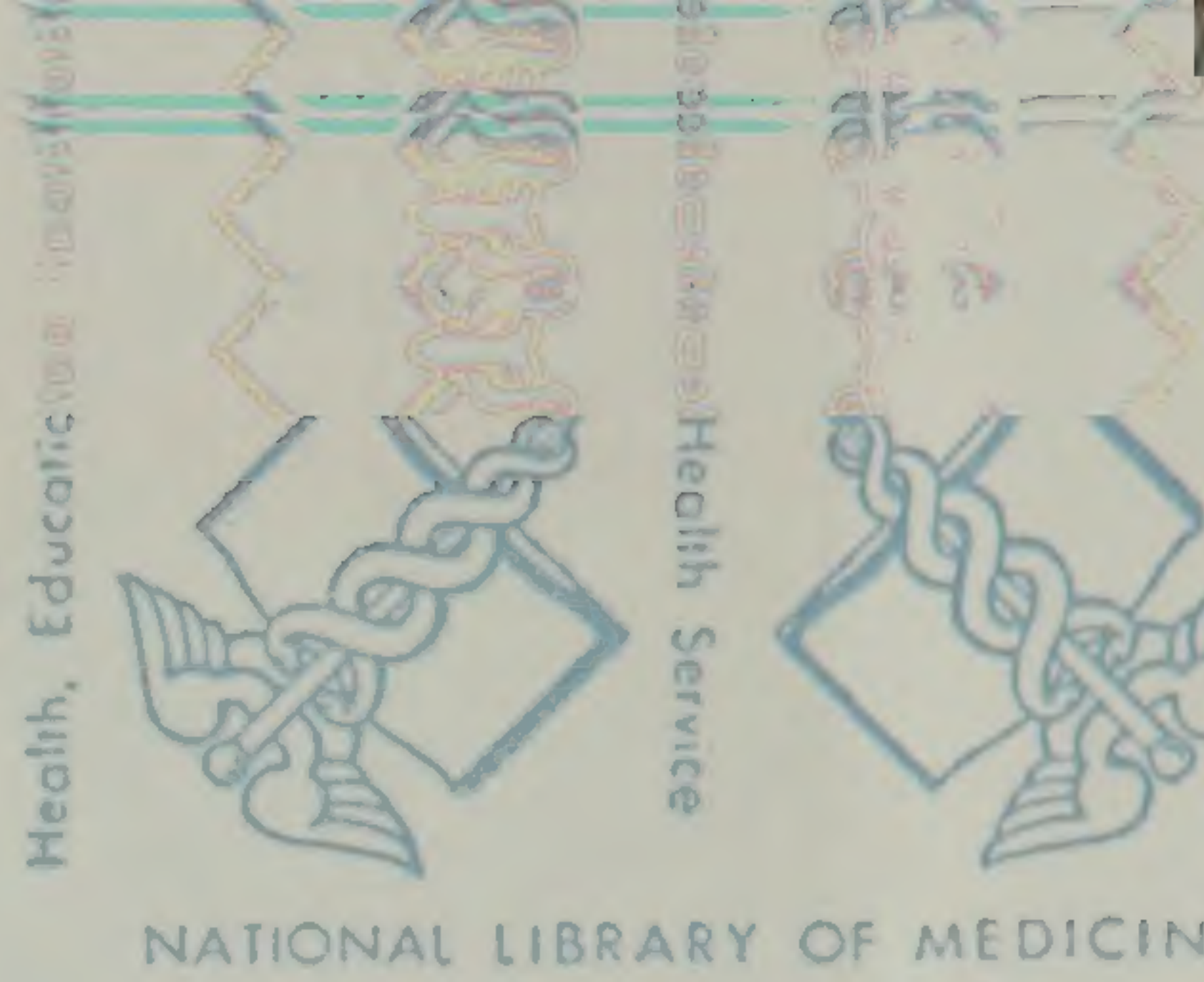


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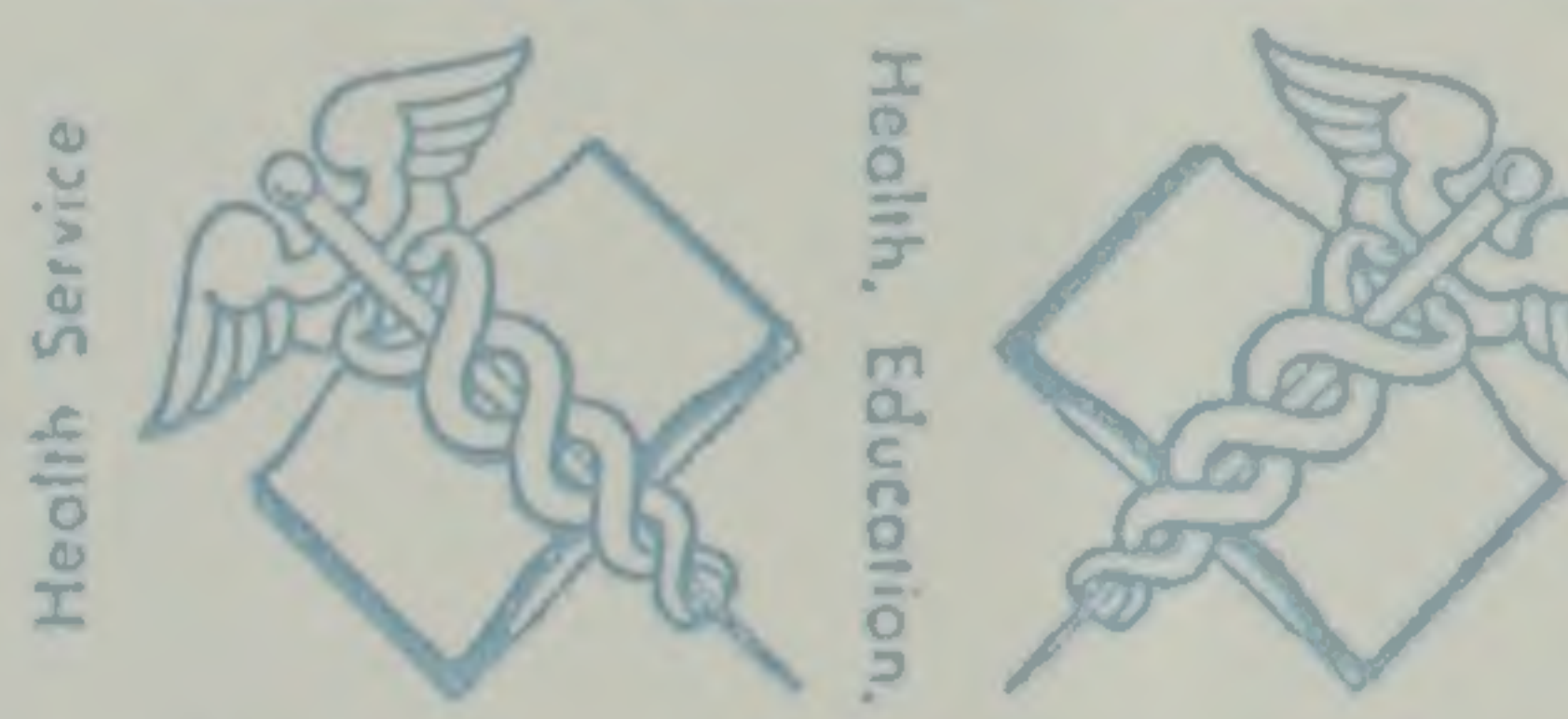
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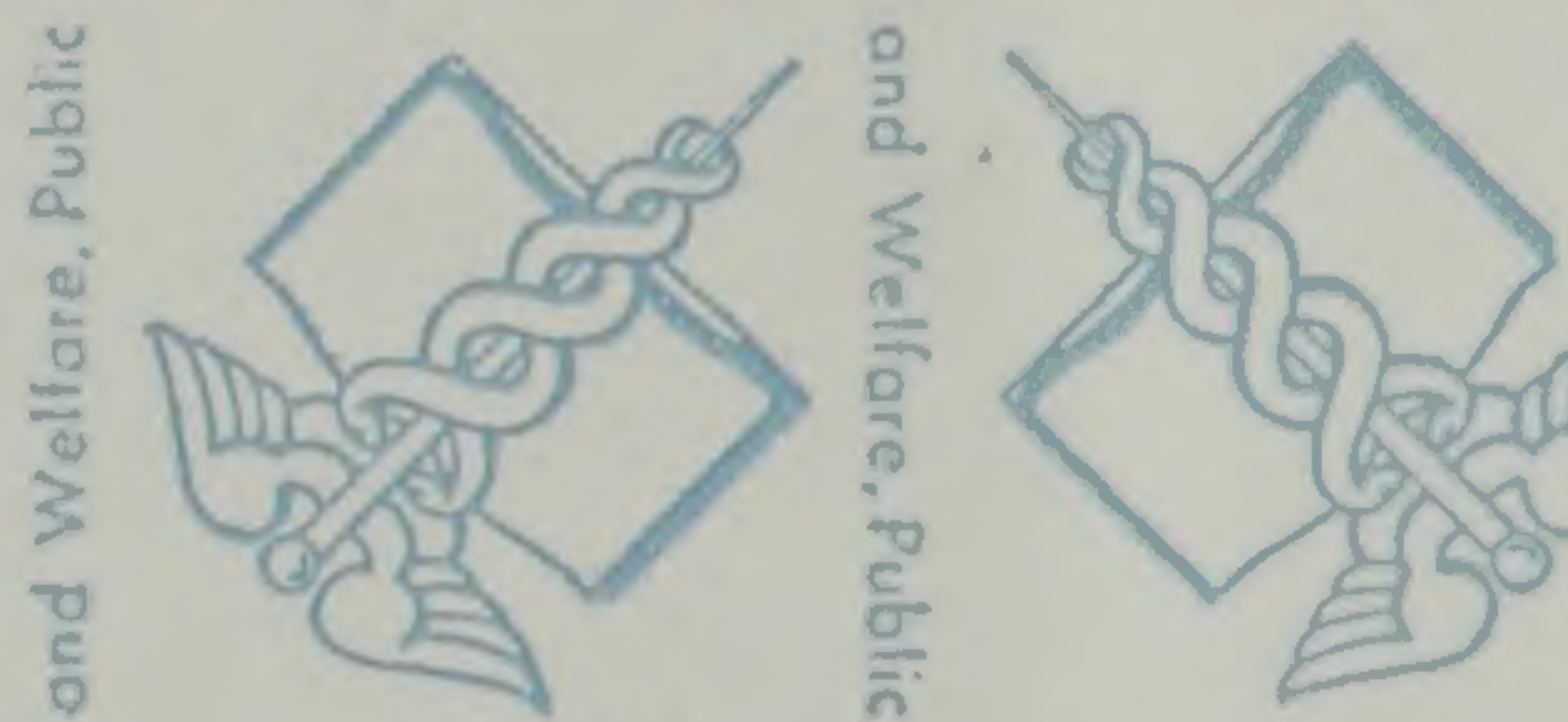
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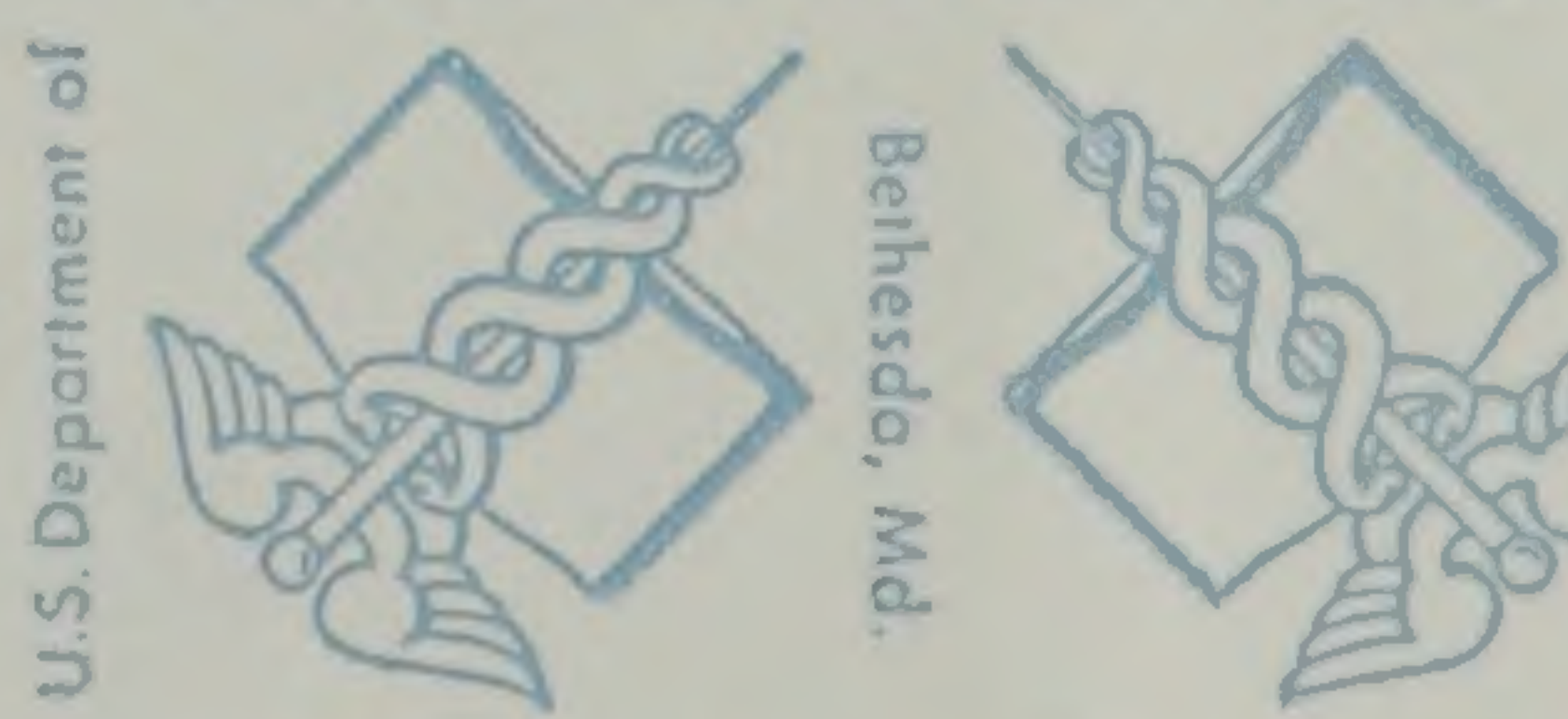
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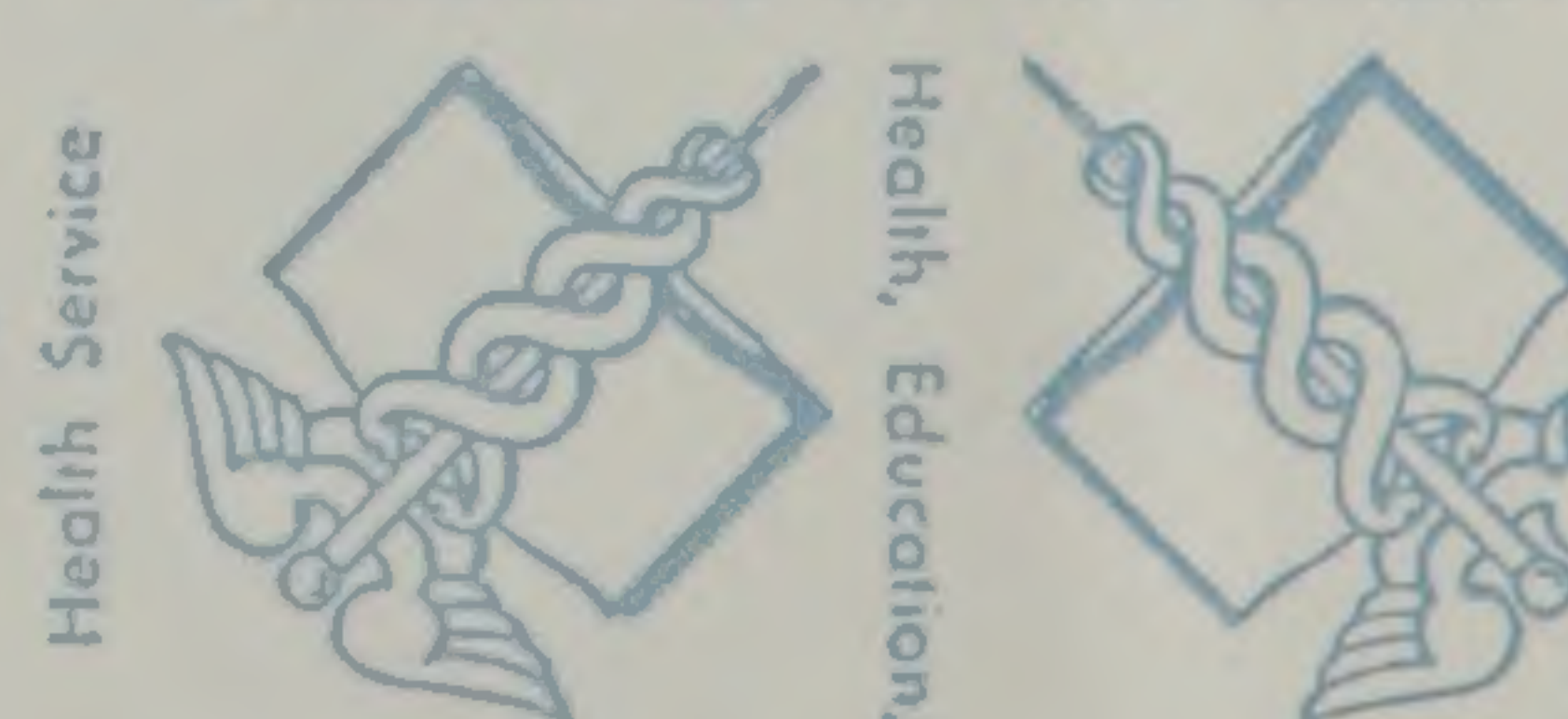
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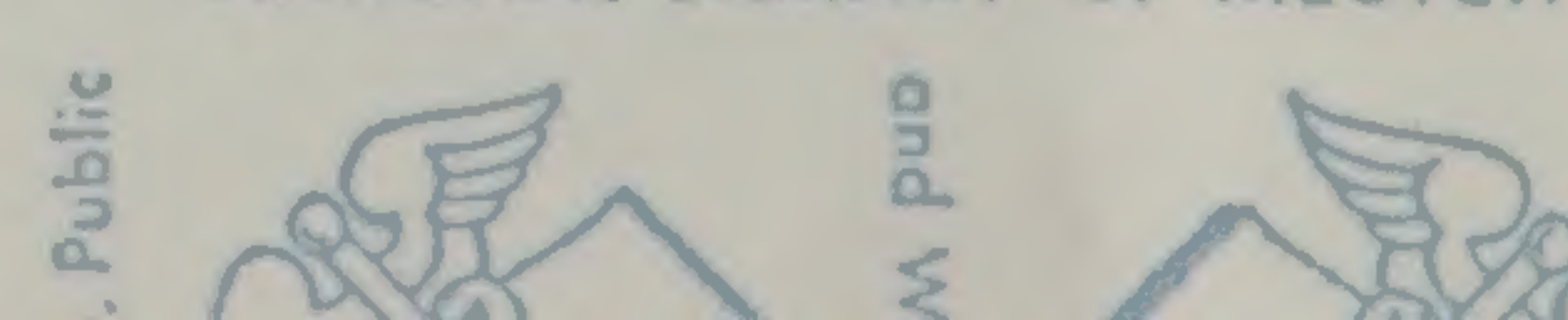
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DISEASES OF CHILDREN.

BY

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PREFACE.

IN presenting this work to the profession the author has aimed to make it a purely clinical one.

In the sections on treatment he has endeavored to give his own experience as much as possible, and has sought to exclude all doubtful symptoms and theoretical indications.

The section on Skin Diseases is from the pen of Dr. Leon T. Ashcraft, Lecturer on Venereal Diseases at the Hahnemann College.

In the section on Nervous Diseases, valuable suggestions have been made by Dr. Weston D. Bayley, Lecturer on Mental Diseases and Clinical Instructor in Nervous Diseases at the Hahnemann College.

C. SIGMUND RAUE.

PHILADELPHIA, 1899.

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DISEASES OF CHILDREN.

CHAPTER I.

HYGIENE AND NURSING.

The New-Born.—Although the care of the new-born belongs, strictly speaking, to the domain of obstetrics, still a few practical remarks cannot well be omitted as an introductory to the subject of nursing and hygiene of children.

As soon as the head is born the mouth and eyes should be cleansed, the latter being washed out thoroughly with a warm boric-acid solution, to be followed by the instillation of a drop of a 2 per cent. solution of nitrate of silver, according to the method of Credé, if the mother be affected with a purulent or specific vaginitis.

After the cord has been dusted over with powdered boric acid and dressed in sterilized cotton or gauze the child should be wiped dry, the body anointed with sweet oil, especially when there is an abundance of *vernix caseosa*, and wrapped in a warm blanket and laid aside until it is convenient to resort to the cleansing bath.

Bathing.—The full bath should not be given until the cord has come off, which is usually about the fifth or sixth day; stripping the cord hastens its separation. The child should always be bathed in a warm room, preferably before an open fireplace. The first bath should be a warm one, approximating the normal body temperature; in hardy children it can gradually be reduced, so that a temperature of 95° F. is reached by the end of the sixth month. It should be of short duration and followed by brisk rubbing. In children who do not react well the full bath must be

either prohibited entirely or it should be followed by a rapid sponging with alcohol and water, equal parts. The free use of soap is a great mistake, as there is no necessity for the daily use of soap, and the irritation of the skin induced thereby often excites cutaneous eruptions.

Clothing.—The material should be of wool; very light weight in summer and heavier for the winter. Grosvenor* speaks highly of the princess-cut Gertrude suit, in which the child's organs have perfectly free play, no constricting bands being present. He also lays stress on the proper construction of the diaper, showing how the unnecessarily large, old-fashioned muslin can be the cause of much harm by overheating the buttocks and kidneys and retaining the excreta too closely.

The Mouth and Teeth.—The child's mouth should be cleansed after each nursing, care being taken not to injure the mucous membrane, as this is often a predisposing cause to one of the forms of stomatitis. Should thrush develop, a mild antiseptic must be used as a mouth-wash.

The care of the teeth has an important bearing on the child's health. Indigestion, enlarged tonsils, cervical adenitis, and catarrhal affections of the throat and mouth can often be traced directly to dental caries. Beside these, there are many other conditions which show little or no signs of improvement until the dentist has been consulted, and all source of irritation from carious teeth, dental periostitis, overcrowding of the jaw, and the like, has been removed.

Much trouble can be avoided and the state of the teeth preserved in a sound, healthy condition by the daily use of the tooth-brush and early attention to teeth showing signs of caries. There are, however, children in whom the teeth become brittle or decay in spite of all prophylaxis; such cases require constitutional treatment.

* "Present Status of Pediatrics," 1895.

Sleep.—The healthy babe enjoys a peaceful, undisturbed sleep, assuming usually a graceful attitude, indicative of complete relaxation. It arouses only to take food, and is seldom awake more than one-half to one hour at a time. After nine months the child gradually becomes more wide-awake during the day, requiring usually two to three naps, and about twelve hours of sleep at night, up to the age of two years.

Children must be carefully trained in regular habits of sleep, for if once allowed to develop, the insomnia of infants is most stubborn to overcome.

As regards *feeding*, the first nourishment should be given at 5 A.M. and the last at 11 P.M.; rarely is it advisable to feed during the night.

To the observant physician a sleeping infant is an interesting study, particularly so in case of illness. There are many valuable signs of disease, frequently absent during the waking state, but becoming prominent during sleep. As pointed out in the chapters on Diagnosis and Treatment, sleep is an important element in diagnosis and in prescribing.

Airing.—The nursery should be sunny and well-ventilated, no draughts, however, being permissible. If the child is allowed to crawl on the floor, there must be a carpet in the winter, and in the summer matting can be substituted. A rug should always be at the door to prevent the draught coming in through the sill and coursing along the floor, which invariably happens when the temperature of the room is higher than that of the hallway. For a similar reason it is advisable to have double windows, or at least curtains, in winter, as a current of cold air constantly flows down the inside of the window-panes, which will surely strike the child if it be allowed to play or sleep in their vicinity.

Airing the nursery in winter is best accomplished by having the windows open in the adjoining room until the

air has been perfectly purified, when the windows should be closed and the communicating door opened to allow a diffusion of the atmosphere from one room to the other. When the child can be removed from the nursery it may be aired like any other room.

In summer, the room should be kept darkened during the heat of the day; and at sunset, when the outside air has cooled off, the windows are opened, while the child may be taken out for an airing.

Statistics show that infants require a greater amount of air-space, proportionately, than adults, and that overcrowding is a prolific source of ill-health among children. This is especially the case in institutions and hospitals for children. Infants require 1000 cubic feet of air-space in order to thrive; but as they grow older they develop greater resisting power to external influences, and may do well under circumstances where no more than the above, or even less, breathing-space is available for each child.

Exercise and Sunshine.—The infant gets its exercise to promote metabolism in crying and in the non-volitional movements it performs. It should, however, have its daily sun-bath and airing. Older children require exercise of a more definite kind, such as walks in the open air, games, etc. A cold sponging every morning aids greatly in the physical development of the child. Fatigue and overexertion in all forms of sport and exercise are to be strenuously guarded against, for the tissues and delicate organs of the growing child are far more liable to receive permanent injury from their abuse than later in life, when they have become accustomed to accommodate themselves to the extra strains not infrequently brought upon them.

Therapeutic Measures.

Cold.—In cold we have one of the best and safest antipyretics known, beside the well-known analgesic and astringent properties it possesses. To get the latter effects cold

is best applied in the form of an ice-bag, a rubber coil through which ice-water is allowed to circulate, or clothes wrung out of ice-water (cold compresses). Cold is a valuable application in most inflammations, but particularly in ophthalmia, meningitis and synovitis; as a rule, heat is preferable in inflammatory affections of the chest and abdomen. Cold compresses are useful in croup; it is contraindicated in diphtheria (GOODNO) and in inflammations of the larynx, trachea and bronchi. (HOLT.)

Heat.—Heat is perhaps the most useful of all non-medicinal therapeutic measures, and has a wide field of applicability. In painful inflammatory affections it acts promptly by relieving tension and hastening resorption. The old-fashioned poultice is rapidly being superseded by hot antiseptic fomentations in suppurative processes, which do infinitely less mischief than the former. Fomentations prepared by wringing a piece of spongiopiline or flannel out of hot water, best immersed into the same by means of a towel and wrung out by winding up both ends of the towel (the water should be slightly hotter than the hand can bear), are most serviceable when quick results are necessary, as in peritonitis, colic, etc. Dry heat is most conveniently applied by means of hot-water bags or baked flannel. It must be remembered that the child's skin is more sensitive and more readily scalded than an adult's, for which reason proper precautions must always be taken.

Baths.—By means of the bath we are able to apply heat or cold most rapidly to the entire body. Hot baths are often useful in collapse and asphyxia neonatorum; by adding a tablespoonful of powdered mustard to the warm bath we have an excellent means of relieving serious congestion of internal organs, through its derivative effect, and a harmless method of bringing out the rash, especially in cases of measles which are slow to develop.

The bran bath is most gratifying in cases of eczema or other excoriated conditions of the skin.

In cases of collapse the child may be placed in a bath of 100° F., which is gradually raised to 110°, until reaction sets in.

The cold bath is best given in the following manner: The child being stripped and wrapped in a light blanket, a bath tub filled with water at 98° F. is brought beside the bed and the child immersed by means of the blanket. The temperature of the water is then reduced by the addition of cold water, but never below 80°. While in the bath, friction must be applied to the child's body to prevent collapse. The cold bath is contraindicated in diphtheria and scarlet fever, and in all cases it must be remembered that the child's temperature falls more rapidly and more persistently than in the case of adults. After the bath it should be dried well and rolled up in a blanket. A rub-down with alcohol and water, equal parts, is often very useful after the plunge bath.

Packs.—Packs are highly efficient antipyretics and diaphoretics; especially is it for the latter effect that they are employed. The cold pack is applied by wrapping the child in a sheet wrung out of cold water, the sheet being surrounded by a dry blanket. When used to reduce fever it can be reapplied hourly, or more frequently, as necessary. In pneumonia the pack is often restricted to the chest.

The hot pack is most useful in nephritis and uræmia, or suppression of urine from whatever cause. A light blanket is wrung out of hot water and applied as above, with the dry blanket on the outside.

The hot *mustard pack* is prepared by adding a little ground mustard to the hot water; it is in many instances preferable to the hot mustard bath, and is especially useful in convulsions, congestion of the lungs and of the brain; also to bring out tardy eruptions. While in use, the head should be sponged with cold water or water and alcohol.

Nasal Syringing.—This is most important in obstruction of the nasal chambers from diphtheric extension, al-

though cases of simple rhinitis are also frequently benefited by the douche. The child is placed in the nurse's lap, its legs held between her knees, and the arms and chest controlled by a towel; the head is inclined somewhat forward, and the blunt nozzle of a douche-bag inserted into one of the nostrils. On raising the bag, the irrigating solution flows into one nostril and out of the other, being caught in a basin held under the child's chin.

Throat Spraying.—The safest and most satisfactory method of bringing an antiseptic or oily solution in contact with the mucous membrane of the pharynx and tonsils is by means of the atomizer. Children are late in learning to gargle, and even this procedure is not always to be commended, as it is at times positively harmful. In case of emergency, however, should the child be unruly, and cry and not permit the use of the atomizer, it can be laid on its back across the nurse's knees, with the head thrown back, and the fluid poured into its mouth, when it will involuntarily gargle. In these cases, however, only such fluids as can be swallowed with impunity are permissible.

Inhalations.—The inhalation of steam is very beneficial in most respiratory ailments, but especially so in croup, and after tracheotomy it is absolutely necessary. In the absence of the specially-constructed "croup-kettle," an ordinary tea-kettle in which water is boiling may be used, the steam being directed under a sheet in the fashion of a tent, overhanging the child.

Lavage.—The apparatus for employing lavage in children consists of a soft-rubber catheter, No. 11, or smaller in the case of very young infants, attached to a piece of rubber tubing two to three feet long by means of a piece of glass tubing, and a medium-sized glass funnel which is attached to the other extremity of the rubber tube. The identical apparatus is also used for gavage. To wash out the child's stomach, it is seated on the nurse's lap, and the index finger of the left hand is introduced into the mouth

to guide the catheter, previously lubricated with glycerin, in its course to the œsophagus. The catheter is seized with the thumb and index finger of the right hand and rapidly passed over the epiglottis, beyond the pharynx, into the œsophagus, when it is usually dragged down into the stomach by the efforts of deglutition. Should the child gag, it may be necessary to force the catheter down; but in the event of continued gagging and cyanosis, it had best be removed and a fresh attempt made.

So soon as the catheter reaches the fundus of the stomach (which can usually be felt, or suspected from the resumed tranquillity of the child), the funnel should be raised to allow the escape of any gas which may be present. It may then be lowered to siphon off the gastric contents. The funnel is now raised; lukewarm water or a boric-acid solution (2 per cent.) is slowly poured in until the child shows signs of discomfort or makes expulsive effort, when the tube is pinched, lowered beneath the level of the stomach, and the water allowed to flow into a basin. Three to six ounces are usually employed, according to the age of the child, and the process is repeated until the water comes out clear.

In lavage we have not only a most useful therapeutic agent, but also a valuable aid in diagnosis. It will give positive results in the following conditions, formulated by Olmièr: Every gastro-intestinal affection; all acute as well as chronic disturbances of the digestion; cases of intestinal occlusion from invagination; congenital constipation, and poisoning.

It is most applicable in the period of infancy, *i.e.*, from the time of birth until two years or slightly over. Serious pulmonary disturbances or cardiac disease contraindicate the employment of lavage. It should be employed cautiously where persistent vomiting is excited by the insertion of the catheter, or where great prostration follows the operation, although it is seldom that bad results follow a proper application of this procedure.

Gavage, or forced feeding, is often necessary during the course of an acute illness and in certain forms of indigestion, when the child refuses to take nourishment, or is unable to do so or unconscious. In these cases the food is introduced while the child is in the recumbent position, care being taken to keep it quiet after the operation. In cases of persistent vomiting, food introduced by means of the tube is often retained. Premature infants are in many instances raised by gavage, when they would otherwise have succumbed without its employment.

Irrigation of the Colon and Enemata.—For simply emptying the rectum the enema is all that is required, but where it is deemed advisable to flush out the entire tract of large intestine it is necessary to resort to irrigation of the colon. The enema is administered by laying the child upon its back with the thighs flexed on the abdomen and inserting the nozzle of a hard-rubber syringe, well lubricated, into the anus. Where soap and water have been decided upon for the injection, it is better to use a small fountain syringe, elevated three feet above the child's hips. The hard-rubber syringe is preferable where such substances as sweet oil or glycerin are employed. The glycerin should always be diluted with three parts water; of this, one ounce may be used.

For irrigating the colon the child is placed on its left side upon a rubber sheet covered with muslin or linen, the hips being slightly elevated. A soft-rubber catheter (No. 25 to 28, French) is attached to the nozzle of a fountain syringe, lubricated, and carefully inserted into the rectum. The water is then allowed to flow in slowly, stopping the stream as the child makes efforts at expulsion. The catheter must be passed through the sigmoid flexure as the water begins to flow and distend the rectum. The fluid will usually reach the colon without difficulty, but cannot pass into the ilium, although it is claimed that if the colon is not distended, and the water allowed to flow in slowly, a closure of the

ilio-cæcal valve does not take place, and so the fluid may even reach into the small intestines. However, if the larger bowels are thoroughly cleaned out we have accomplished our end. After a quart of fluid has run in, it should be allowed to escape by removing the nozzle from the catheter, and the process repeated until it comes out clear. Tepid water, 80° to 95° F., answers best for ordinary irrigation; boric acid may be added (2 per cent.), if desired.

Irrigation of the colon is useful in diarrhœas, especially if they are offensive, or contain an abundance of mucus or undigested, irritating particles. Hot injections have been used in collapse and cold in hyperpyrexia, but the latter procedure is entirely uncalled for.

Inunctions and Massage.—The nutritive value of oil inunctions renders this form of treatment of great usefulness in all cases of malnutrition and wasting diseases. Beside the direct nutrition resulting from the absorption of the oil or fat, there is also a decided stimulus imparted to the entire nutritive process of the organism by the friction and kneading of the surface associated with the procedure. For this reason it really encroaches upon the field of massage, from which it borrows a most useful therapeutic measure.

Massage is perhaps more limited in its field of usefulness in diseases of children when compared with its applicability in adults, but nevertheless there are many conditions in which it must always remain indispensable.

After the bath it is always well to apply general massage to the child, especially if it be of a delicate constitution and slow to react. During the cold or graduated bath it is necessary to employ it to keep up peripheral circulation.

Effleurage and *Pétrissage* (stroking and kneading), together with passive motion of the joints, especially the smaller ones, are the procedures employed in the above conditions.

General massage is often of great value in cases of malnutrition, anæmia, most constitutional diseases, and espe-

cially in nervous diseases. "It becomes almost a necessary adjuvant in functional nervous conditions in which over-feeding, combined with rest, forms the principal therapeutic means, and in organic nervous diseases generally, to promote local and general nutrition."—(BARTLETT.)

Massage of the abdomen is a valuable adjuvant in the treatment of chronic constipation. The warmed hand is placed on the abdomen in the region of the umbilicus, and under gentle pressure rotary movements are executed for a few minutes. The hand is then passed from the right iliac region upwards, following the direction of the colon, across the abdomen, and down on the left side, repeating the procedure several times. In this way friction is directly applied to the walls of the intestines, together with a displacement of their contents in the normal direction.

CHAPTER II.

THE METHODS OF CLINICAL EXAMINATION.

Growth and Development.—The rate of increase in the child's weight is a safe means of judging of its progress during both health and disease. Absence of the regular weekly gain in weight indicates that the child is being improperly nourished, if there are no signs of actual disease present. Often, however, an insidious disturbance, such as tuberculous meningitis, tabes mesenterica or marasmus, is to be suspected, the ultimate course proving the correctness of this suspicion.

Together with the increase in weight there must also be a proportionate increase in length, if the case is to be considered as progressing normally. According to Schmid-Monnard, there is an increase in length of three-quarters of an inch per month during the first year.

The weight may, roughly stated, be said to double itself in five months, and be trebled at the end of the first year. During the first four months the babe gains about a half pound per week; this gradually falls off until there is one-half to one-third of that rate of progress.

Dyscrasia; Diathesis; Temperament.—By a careful study of the features whereby the various dyscrasiæ, diatheses and temperaments are recognized and differentiated, we are not only greatly aided in rapidly coming to a correct opinion in a given case, but the prognosis and treatment will be likewise influenced. Often the simple recognition of a diathesis will lead us to the seat of trouble by excluding all other possibilities in the case, and the recognition of a temperament may explain the presence of a certain disturbance.

A dyscrasia represents a contaminated systemic con-

dition resulting from the introduction of morbid agents into the system, or through their generation within the system. The former condition is encountered in the various systemic infections, while the latter is exemplified in the acid dyscrasia. A diathesis is a constitutional peculiarity inviting the development of certain pathological processes, but this term is usually employed to designate the presence of evidences of such diseases as tuberculosis, scrofula, rickets, rheumatism and syphilis in the individual thus affected.

The scrofulous child is stout and flabby, is subject to glandular enlargements and catarrhal conditions of the mucous membranes and skin; the features are usually coarse, the temperament phlegmatic, and the cerebral faculties dull.

The tuberculous or phthisical child is of an active temperament, bright and precocious; the frame is sparely developed, the skin delicately transparent, the hair generally soft and silken.

The syphilitic infant is recognized by the hoarse cry, the snuffles, ulcerated nasal septum, the characteristic eruptions, especially in the groins and about the anus, the old, withered look, due to malnutrition. Later in life we notice the broad, flat root of the nose, the linear scars about the angles of the mouth, Hutchinson's teeth, interstitial keratitis, and many other possibilities. Of course it is unreasonable to expect to find all of these signs in every case of hereditary syphilis, but careful examination will usually detect sufficient to clinch our diagnosis.

The rachitic child is typical in appearance. When well developed there is the characteristic square head, the epiphyseal enlargements, the beading of the ribs, bowing of the long bones, pot-belly, enlarged spleen, profuse sweat about the head, anæmia and constipation. In abdominal tuberculosis we also have the large belly; but here the small chest, the wasted thighs and the absence of typical rachitic manifestations will easily differentiate the two.

Rheumatism is more extensive in its areas of distribution

in children than in adults. The joints are not so severely affected as the endocardium and nervous system, as a rule. Tonsillitis, with fever and aching in the limbs, is often the only outward manifestation of an acute attack of genuine rheumatism, during the course of which the heart is often involved, or chorea follows as a sequel. The rheumatic diathesis, therefore, often presents itself by nothing more than the common joint-pains, often called growing pains; urinary disturbances, pointing to incomplete oxidation and elimination of excreta; a general retardation of the nutritive processes, from which gravel and biliary calculi may result; anæmia; subcutaneous fibrous nodules; chorea and endocarditis, and certain forms of cutaneous eruptions.

Bouchard recognizes only two diatheses, namely, *scrofula*, or a predisposition to tuberculosis, and *arthritism*, a predisposition to certain diseases in which the process of nutrition is retarded (viz., rheumatism, gout, diabetes, cholelithiasis, etc.) He defines a diathesis as a *predisposition*, but not as a disease. It is evolved from the patient's peculiar constitution and temperament, conditions directly traceable to heredity.

The Methods of Physical Examination.

Inspection is the first step in the examination of a sick child. What has been discussed in the previous section should be put to a practical test in beginning the study of a case, and so the diathesis, temperament, state of development and nutrition and individual peculiarity of the patient are first to be noted. If the child is of a tuberculous diathesis, presenting the constitution and temperament peculiar to the same, we naturally suspect the possibility of pulmonary mischief; or, if such a child complains of a pain in the knee, we immediately turn our attention to the hip-joint rather than believe the same to be of rheumatic origin, in which case we would expect to find other prominent evidences of rheumatism.

To satisfactorily inspect the child it must be stripped and viewed from front and back, standing and reclining.

The *diathesis* having been noted, the development of the *framework* should next demand our attention. Is the child emaciated? If so, in what particular locality is this most prominent? The prominent belly, small chest and wasted thighs have been referred to. If there is any deformity of the *spine*, we must determine whether it is due to Pott's disease, rickets, a unilateral pleural effusion, old pleuritic adhesions, or unequal muscular development.

The *head* presents many peculiar features of prominent diagnostic value. In rickets it is large and square; in hydrocephalus large but rounded, the fontanelles are widely open, and the eyeballs displaced downwards. In rickets there are often parchment-like areas representing a thinning out of the bony elements, known as craniotabes. The osseous nodes of syphilis are very characteristic.

The facial expression often points to the seat of trouble; for instance, the knitting of the brows in headache and meningitis, especially when associated with squinting; the fan-like motion of the *alæ nasi* in respiratory troubles, and the pinched expression of the face in abdominal disease. Roughly speaking, it can be said that the upper part of the face represents cerebral, the mid portion respiratory, and the lower portion abdominal disturbances. Often one cheek will present a circumscribed redness, which is said to correspond to the side affected in pneumonia. In severe pulmonary infiltration or congestion and in some forms of heart disease the obstruction to the circulation will become manifest by networks of enlarged capillary vessels seen on the cheeks (also on the chest, and sometimes on the palms of the hands).

The *chest* may present deformities, peculiarities of the ribs, deviations from the normal respiratory movements, abnormal movements, and various skin eruptions.

In rickets the sternum is prominent from lateral compression of the costal cartilages (*pectus carinatum*), and the pathognomonic beading of the ribs, the "rickety rosary,"

is often present. In phthisis that portion of the chest covering the consolidated lobe is flattened, does not move in the same degree as the unaffected portion, the clavicle stands out prominently, and there is often marked retraction of the ribs in that region. A pleuritic effusion causes a bulging; an old plastic pleurisy or empyema may leave the side retracted.

In emphysema the chest assumes a rounded fullness, slight motion being perceptible during respiration. After pericarditis with adhesions the intercostal space is often seen to retract distinctly during the heart's diastole.

The *spine* has been referred to. Spina bifida must not be overlooked.

The *limbs* and *joints* must be examined for evidences of arthritis or tuberculous joint troubles; the fibrous subcutaneous nodules pathognomonic of rheumatism; the deformities of rickets, rheumatism, and poliomyelitis anterior; the bone affections of syphilis and tuberculosis. The limbs will also give evidence of the various forms of paralysis liable to occur in childhood, and the rachitic pseudo-paralysis.

The *position* of the child assumed during sleep and waking is important to note. We see the child burying its head in the pillow in cerebral inflammations; lying on the back with limbs drawn up in abdominal inflammations; on the affected side in acute pleurisy; the head drawn back and the spine arched during opisthotonos; unable to lie in the prone position in the dyspnœa of capillary bronchitis; sleeping or comatose; crying out in sleep and gritting the teeth. During natural sleep the child assumes an easy, graceful position, indicating complete relaxation; the respiration is of the abdominal type.

The character of the *cry* is often a hint in diagnosis. The shrill, piercing cry of meningitis is pathognomonic. The hoarse cry heard in the absence of croup smacks of syphilis. In otitis the crying is often continuous, in spite of all that is done to humor the child. The

recognition of the cry of hunger, pain and anger is more readily attained by observation than can be described. In pulmonary inflammations there is often absent the inspiratory element of the cry, a simple moan or expiratory effort being noticed.

The inspection of the *throat* is left to the last on account of the struggles and resistance of the child usually induced thereby. It should be done quickly and thoroughly, and all preparations must be made beforehand, relative to the examination. Taking the child into a good light, or in some cases a head mirror may be used, it is seated on the nurse's lap or held in her arms, the head slightly thrown back, and the handle of a spoon pressed down firmly on the base of the tongue. This is very often followed by gagging or a violent expulsive effort, but if we are quick we have seen enough. The gagging brings to view every part of the fauces, which is often desirable to gain access to the lateral regions. In contagious diseases we should be prepared for the sudden cough which is liable to occur and spurt mucus or pieces of membrane into our face. Often nothing more will be necessary than to allow the child to cry, during which act a satisfactory view of the mouth and throat is obtainable. We must cultivate the habit of taking in the whole picture at a glance and retaining the impression long enough to analyze it, otherwise much valuable time will be spent in bungling efforts.

Palpation.—The sense of touch, when properly trained, will give more information in the study of sick children than is generally supposed. The first thing that strikes our attention as we touch the child's body will be the temperature, and with a little practice this method of judging of the degree of fever will become accurate enough for many cases. We should observe whether the heat is uniform, or whether one part of the body is hotter than another, for the head may be considerably hotter than other portions of the body; in the later stages of entero-colitis

the abdomen will be hot, while the extremities may be decidedly cold.

In palpating the *head* we determine the state of the fontanelles, whether they be delayed in closing or prematurely closed; whether bulging or depressed. We also look for craniotabes, exostoses, and any evidence of sensitiveness of the scalp or ears, this often hinting at middle-ear disease when other more prominent signs are wanting. If this sensitiveness to touch be general, it often marks the advent of rickets.—(JENNER.)

From the head we can descend to the *chest*, taking in the *neck* on our way down, where we often find scrofulous enlargement of the cervical glands. Often, however, no definite sequence can be followed out, and we must avail ourselves of an opportunity presented by the child either crying, ceasing to cry, or finding it in a sound sleep, to proceed at once to palpate the abdomen, which can only be done satisfactorily during complete relaxation.

In an examination of the chest palpation is usually the first step, and if the child will accommodate us by crying we can judge of the vocal fremitus. The child should be held by the mother in such a manner that it rests on one of her shoulders and presents its back to the physician. The hand is placed on the back in order to determine vocal fremitus, and the rattling of mucus in the bronchi is distinctly transmitted to the hands, in bronchitis. The hands can then be placed on the sides of the chest and the respiratory movements of both sides compared. The left hand will now seek the cardiac area, by which means hypertrophy or a thrill can often be detected.

Auscultation should follow next in chest examinations, for the disturbance induced by percussion will often be so great as to hinder any further progress in the case.

The *abdomen* is most satisfactorily palpated while the child is asleep, the warmed hand being gently introduced under the bed-covering. Distention or retraction of the

abdominal wall has been noticed by inspection; the sensitive palpating hand will note enlargement of the spleen, the presence of nodules, or friction between the abdominal wall and organs; in fact, signs indicating, respectively, rickets or malaria in the first case, tabes mesenterica secondly, and in the last instance, if there is fluid and no decided pain, tuberculous peritonitis.

The *thighs* are a valuable indication of the state of nutrition. If the adductor muscles are wasted, soft and flaccid to the touch, and the skin capable of being pinched up into folds, slow to disappear, we have a marked picture of wasting.

The *skin* furnishes valuable diagnostic signs. The temperature has been noted. The state of dryness or moisture is determined by palpation; often an eruption can be better felt than seen, and the shotty feel of the skin in the early stages of small-pox is very characteristic.

The *tache cérébrale* is a peculiar condition first described by Trousseau. It is a hyperæmic streak obtained by irritating the skin in cases of meningitis—a patch of angio-paralytic area.

Percussion.—The usual order of examination observed in adults cannot be observed in children, as has already been pointed out. On account of the disturbance it is liable to produce in the child's tranquillity, percussion had best be left to the last in chest affections, just as the inspection of the throat is put off until all other data have been obtained, when the disturbance points to that locality.

Percussion of the *head* is of little value excepting for the purpose of eliciting tenderness, especially over the mastoid regions, when ear disease is suspected.

The *chest* is percussed from the back and sides, and the same method as practiced in the case of adults is observed here. We must simply remember that the child's thorax is usually hyper-resonant as compared to the adult, and owing to the pliability of the chest, a cracked-pot sound

can often be elicited, especially when the child is crying. The possibility of emphysema and cavity must, however, not be overlooked.

In *abdominal* disease percussion is also of great value; the abdomen may be distended either from gas, fluid, or solid growths, and percussion, together with the signs of fluctuation, when obtainable, will clear up the case satisfactorily.

The *reflexes* may be classed under percussion for the sake of convenience, the patella and elbow reflex and the ankle-clonus being the most frequently-employed diagnostic signs.

Auscultation.—For the purpose of auscultating the chest, the child is best held in the position recommended for palpation and percussion; and we must remember that it is wise to take the first opportunity offering itself by the child's good behavior if we wish to hear the respiratory sounds with any degree of satisfaction. Having progressed thus far, it will be a real benefit should the child cough or begin to cry, for then we will be able to compare the sounds thus obtained with those just noted. We cannot order the child to count, whisper, or answer questions while we are auscultating its chest, but an attack of crying will often answer the same purpose for determining broncophony or absence of all function in a particular locality.

While the child is asleep, we can often make a very satisfactory examination by the use of the phonendoscope, the use of which instrument should, however, be confined to such emergencies, or simply to verify conditions discovered by other means.

The *heart* is often examined to the best advantage from the back in very young children; in older ones, however, the method employed in adults is to be instituted. The examination of this organ should not be neglected where the slightest suspicion of a rheumatic condition is entertained; also where there are signs of chorea, a previous history of cyanosis, dyspnœa, or general weakness traceable to no definite cause, and during the acute infectious fevers.

Auscultation is seldom of use in abdominal conditions in children.

Pulse, Temperature, Respirations.—As in adults, the pulse is best felt at the wrist in children, although it can at times be taken with advantage through the anterior fontanelle. The pulse is very rapid in infants, gradually decreasing in frequency during childhood, and attaining the average rate of 76 in males and 80 in females by the time of puberty. In young children the rhythm is variable and irregular, owing to the incomplete development of the physiological inhibitory centres. The pulse-rate is often affected by physiological influences to such an extent that it cannot be taken as a safe criterion of fever, which can only be surely determined by palpation and thermometry.

During the first weeks of life the pulse-rate varies between 125 and 150 beats per minute; more rapid in female infants, as a rule, and not influenced by posture.

From the sixth to the twelfth month it is usually 105 to 115, and more susceptible to bodily exercise.

From the second to the sixth year it may be said to vary within 90 to 105 beats; seventh to tenth year 80 to 90 beats, after which it gradually attains the average adult standard.

The strength of the pulse is our guide in judging of the heart's condition, and must be carefully observed during the course of the acute infectious fevers and pulmonary inflammations.

One of the most satisfactory results to be obtained in studying the pulse is when we compare it with the temperature and respiratory ratio. Thus in a beginning typhoid fever the temperature may have risen several degrees above normal while the pulse-rate is unaffected. Later it may rise entirely out of proportion to the temperature. The pulse does therefore not rise in a uniform ratio with the rise of temperature in all cases, although as a rule one degree of fever-heat is usually accompanied by an increase of eight pulse-beats.

“A pulse-rate rather slow in proportion to the temperature is favorable as indicating a tranquil nervous system. A low pulse with high temperature invites us to look for spinal cause, as pressure on the brain, depressing action of drugs. A low temperature and frequent pulse points to local complications in the thorax or pelvis.”—(WUNDERLICH.)

“A slowness in the pulse has often a great significance in the diagnosis of cerebral affections, and especially meningitis.”—(FINLAYSON.)

Irregularity in the pulse is also found in meningitis, combined with slowness. When the pulse is more rapid, the fever prominent and the breathing embarrassed, we should suspect peri- or endocarditis.

“The number of respirations per minute does not correspond so closely to the temperature as the frequency of the pulse. In collapse there is often (not always) a frequency of respiration, and in slight fever of childhood also; in moderate fever the respirations amount to 20 or so per minute; in children to 40 or 50. In considerable or extreme degrees of fever they are higher yet, 60 in many cases; movement also increases their frequency.” In pneumonia and congestion of the lungs the rate of respiration is entirely out of proportion to the fever and pulse, and greatly quickened respirations should immediately lead us to examine the chest.

The temperature is best taken by inserting a clinical thermometer, lubricated with vaselin, into the rectum. It is usually a trifle higher than in the mouth, but it is much more satisfactorily taken here, and far more accurately than in the axilla. The diurnal variation in the temperature is more pronounced than in adults, varying within a range of from two to three degrees. The lowest temperature is attained shortly after midnight, when it may be as low as 97° F. in the rectum, rising to a height of 100° F. in the afternoon, in some instances.

The Urine.—The difficulty of obtaining a specimen of urine for chemical examination, and of estimating the total quantity in 24 hours, leaves the clinical study of urine in infancy and childhood a much-neglected branch. Fortunately the necessity for studying the urine does not arise as frequently in children as in adults, but when presenting itself it is of the highest importance that we should know how to proceed. For ordinary purposes a clean sponge can be placed over the genitals and held in place by the diaper, which should have a layer of oiled silk or other impervious material on its inner surface. When the child has micturated, the urine is squeezed from the sponge into a clean vessel. By measuring the quantity thus obtained and noting the number of urinations in 24 hours we can quite accurately estimate the total quantity. Often the variations in the frequency of urination are a safe enough guide in estimating the functions of the kidneys. Should the quantity obtained by the method detailed above not be sufficient for a chemical examination, the process can be repeated until enough is obtained. Instances may arise where the catheter will have to be used, in which case a sterilized No. 9 to 11 French soft-rubber catheter is to be employed. This will be found most practicable and easily accomplished in female children. The urine can sometimes be forced from the bladder by gentle stroking in the suprapubic region, it being received into a beaker glass held under the penis.

The daily quantity of urine gradually increases from about eight to twenty ounces at six months to two years, until it attains two pints and over at puberty. The frequency of urination gradually decreases as the child develops and gains more control over the sphincter vesicæ; the act is involuntary until after the second year.

The variability of the character of the urine in childhood is well known. At times it will be high-colored, staining the napkin, and causing the child to cry while urinating,

from the presence of urates and uric acid: again it may be turbid from mucus or white urates, especially the latter, in intestinal indigestion. The odor is in many cases quite pronounced.

Albumin should be suspected when the urine imparts a slight amount of stiffness to the diaper on drying; in fact, it may be so abundant as to stiffen the cloth like starch. Blood is most likely to originate in the kidneys in childhood, especially in scarlatinal nephritis, and gives the urine a smoky appearance. Sugar is often present in the urine of infants without any special reason to account for it; it is probably derived from the lactose in the milk, especially when there is a greater consumption than can be assimilated.

The presence of urates and uric acid has been referred to. It is usually indicative of a gouty diathesis, especially when the parents present such a history.

Indican is sometimes found in the urine of children, probably as a result of intestinal putrefaction. Its frequent association with epilepsy is its most important feature.

CHAPTER III.

METHODS OF RECORDING AND PRESCRIBING.

THE accurate recording of cases and the pursuance of a systematic method of prescribing for sick children is of the same importance as systematic methods of clinical examination. Neither a positive diagnosis nor an accurate prescription can be made until we have obtained a complete history, and a prognosis may depend entirely upon certain factors in the family history or in the previous history. For example, the diagnosis and prognosis in a case of broncho-pneumonia will be influenced to a great extent by the presence or absence of a family history of tuberculosis; a syphilitic history will give a definite understanding both from the standpoint of classification as well as treatment in certain cutaneous, catarrhal or osseous affections, and gout and rheumatism in the parents will account for and explain a series of conditions which might otherwise have baffled even the keenest observers. The potent factor played by heredity in tuberculous disease of the brain, lungs, glandular and osseous system is universally recognized. Heredity can be explained as the continuation of a physiological entity, made possible by the production of offspring. In the cell, which multiplies by fission, it is easy to understand that the newly-formed cell must partake of the characteristics of the original mother-cell, for it is an actual part of its protoplasm; gestation is simply a more complex process.

We must, therefore, get the family history before we can make an accurate diagnosis, so that we can exclude all the possibilities in the case and prove that which is actually present.

Atavism, or the tendency of certain diseases, notably

tuberculosis, to reappear after having skipped a generation, must not be overlooked.

The temperament of the parents is often useful to note. It will explain certain tendencies in their children, especially when the temperaments are not well balanced, or when temperamental peculiarities and neurotic tendencies are augmented in the child through the intermarriage of near relatives.

Having considered all inherent peculiarities, we next proceed to note the extraneous influences which may have affected the child. The condition of the child at birth; the mother's health during pregnancy; the character of the labor; the mode in which the child was fed; dates of teething, walking, talking; previous illnesses—enlightenment on these topics is of extreme value in intelligently interpreting a case.

The history of the present illness is then to be inquired into. It should always come from the individual who understands the child best and takes the greatest interest in it. This, unfortunately, is not always the mother, although in the vast majority of instances she will be the one to turn to.

Excepting in acute illnesses requiring immediate attention, the above course is to be pursued in obtaining the history. When we have satisfied ourselves as to the diagnosis and prognosis we will proceed to view the case from another standpoint, namely, that of the therapist. Pathogenesis and pathology are so closely united that we can scarcely draw the line between them, especially at the bedside. While we are observing a sick child, hearing the family history, linking it with the child's personal career, and forming our views as to the pathological processes going on or having left their traces behind, our mind involuntarily turns to the remedies producing similar disturbances in the organism, and which we employ for their curative effect upon these indications.

Each diathesis has a group of remedies wonderfully adapted to its needs; the temperaments are well defined in our *materia medica*; and the constitution likewise, whenever presenting special susceptibility to a drug, has been noted under the clinical indications of our symptomatology.

The plump, fair, precocious *calcareæ carb.* child, predisposed to glandular enlargements, skin eruptions and bone affections, is a familiar picture. The difference between such a case and one calling for *calc. phos.*, *silicea*, *sulphur*, or some other antipsoric, is so distinct that mistakes can only be made by inaccurate observation.

The previous history often hints at a constitutional remedy; thus, late appearance of the teeth and a late closure of the fontanelle will suggest *calc. phos.*; the opposite condition will rather point to *calc. carb.* Former skin eruptions, especially when combined with snuffles and sore mouth, will indicate that one of the *mercuries* may be useful; or if the child comes to us with a history of having been salivated, *hepar* and *nitric acid* will suggest themselves. Certain remedies we know to be especially useful in removing the remote effects of various ailments; thus, *thuja* and *silicea* after vaccination, *sulphur* after pneumonia, *lachesis* after malaria, *carbo veg.* after whooping-cough. Again, disturbances resulting from the abuse of such drugs as *iron* and *quinine* often require *pulsatilla*; after anodynes, purgatives, cough mixtures and the like *nux vomica* will prove useful.

We next observe the position assumed by the child during sleep and waking. This often offers valuable suggestions for a remedy.

The condition of the skin, whether dry or moist, hot or cold, red or cyanotic; also, if eruptions be present, their characteristic features—all important to the prescriber.

The physiognomy may offer suggestions; the knitting of the brow hinting at *stramonium* and *helleborus*; the fan-like motion of the *alæ nasi*, *lycopodium* and *chelidonium*.

The character of the cry may indicate *apis*, when there is cerebral disturbance; it may point to *bell.*, *acon.* or *puls.* if otitis is diagnosed, or *mercury* and *kali bichromicum* when syphilis is suspected from the hoarse, feeble tone. Sudden hoarseness should, however, lead us to suspect the advent of croup, when we naturally choose between *bell.*, *spongia*, *iodine* and *bromine*; here the temperament will aid in differentiation.

The special systems are now to be investigated for objective symptoms. These naturally play the most important rôle in prescribing, for subjective symptoms cannot be obtained in the vast majority of cases; and when we are able to get a verbal statement from our little patient, it is very often misleading, and always more or less inaccurate.

In examining the chest we aim to define the character of the râles present, and are thereby able to differentiate remedies. Thus, *ant. tart.* and *ipecac.* are distinguished by the predominance and finer character of the râles in the latter; in *ant. tart.* there are large râles rattling in the trachea from the accumulation of mucus which the patient is unable to cough up. In a beginning pneumonia crepitation will indicate *sulphur*; pleural friction points to *bryonia*. So also will the discovery of consolidation and effusions aid us in prescribing.

Objective signs in cardiac disease are also valuable aids in prescribing, only to mention *acon.* and *rhus* in hypertrophy, *spigelia* and *bryonia* in endocarditis, *lachesis* for the venous stasis and dyspnœa of organic heart disease, *glonoin* for the high arterial tension, etc.

In prescribing for diseases of the nervous system we must carefully differentiate the various conditions occurring here. Thus, in differentiating cerebral anæmia and hyperæmia from inflammatory processes our prescribing will necessarily be more accurate and successful.

When we decide that the meninges are involved, a host of well-known remedies immediately present themselves.

To differentiate between them we must take into consideration the degree of fever and cerebral congestion; the presence or absence of convulsions, photophobia and strabismus; the psychical state, manifested by the disposition, character of sleep and state of consciousness; delirium or coma. This, together with a general survey of the patient, gives the data for finding the similimum.

And so the special senses, the alimentary tract and the genito-urinary tract are all to be carefully studied in the manner above detailed, in order to gain the requisite knowledge for making a prescription. The results of such prescribing bring their due reward; it is time well spent in fruitful labor.

CHAPTER IV.

INFANT FEEDING.

A COMPARISON of the results obtained by artificial feeding and breast feeding indicates conclusively that, as ordinarily practiced, the artificial method fails to successfully supplant nature's method.

The question naturally arises, can a child be weaned with any degree of safety before the usual time, and can those who are deprived of breast milk from the very beginning of their existence be spared the gastro-intestinal derangements and the later constitutional manifestations of faulty nutrition which are almost universally the lot of hand-fed children?

A close study of the subject of infant feeding reveals the fact that nature can so closely be imitated by carefully and intelligently-conducted methods that but very slight difference in results, if any, should occur. In the first place, we must study the chemical composition of human milk, and furnish the child with a substitute having a similar composition. Secondly, the food must be rendered perfectly sterile and of the same temperature of breast milk, as the latter is entirely free from pathogenic and fermentative micro-organism when secreted from a healthy breast, beside being of the body temperature. Thirdly, the proper quantity must be administered, and at regular and suitable intervals. If these conditions are carried out, artificial feeding becomes robbed of its terrors, and becomes a boon to unfortunate infants and sickly and delicate mothers who are not able to stand the drain of nursing.

Human Milk Studied in Comparison with Other Milks and Feeding Mixtures.

Human milk is an alkaline fluid, bluish-white in color, of watery consistency and sweetish taste. It contains a slightly lower percentage of total solids than cow's milk, and considerably less proteids, but a higher percentage of lactose (sugar of milk). This accounts for the difference in appearance and taste. The amount of fat is about equal in both, unless we take into consideration the milk of special breeds of cows, such as the Jersey, in which the fat may be as high as five per cent., more than one per cent. above average human milk.

The distinguishing feature of human milk is its low percentage of proteid, as compared with other milks. The amount of this nitrogenous element ranges between 1 and 2 per cent., the average obtained by Cautley from a large number of analyses being 1.93 per cent. Cow's milk contains almost uniformly 4 per cent. of proteid. In good dairy milk, where we obtain a mixed product from many cows, it seldom varies from this standard, and it can be kept so by the proper feeding and management of a herd. Mother's milk presents a much greater fluctuation, owing to the highly susceptible nervous system of the human subject.

There is, however, a difference aside from percentage in the matter of proteids, for the proteids of human as well as of cow's milk are not a single body, but they can be resolved into caseinogen and lact-albumin, two bodies of totally different character and composition. In cow's milk the proportion of caseinogen to lact-albumin is 4 to 1; in human milk, 2 to 1.—(KÖNIG.)

Caseinogen is precipitated by acetic acid or by a saturated solution of magnesium sulphate. The lact-albumin is not affected by these reagents, but precipitates under tannic acid and by boiling. It is the chief constituent of the scum which forms on boiled milk. To estimate the percentage of

lact-albumin in a given specimen of milk it is first necessary to precipitate the caseinogen with acetic acid, filter, and in the filtrate the lact-albumin can be estimated by tannic acid.

The caseinogen found in human milk forms a much finer curd with acid than the caseinogen of cow's milk. Again, the greater proportion of caseinogen to lact-albumin in cow's milk is another factor making it less digestible and suitable for the infant.

Ass's milk more closely resembles human milk in the amount of proteids present, according to an analysis by Dujardin-Beaumetz, containing 1.23 per cent. proteids, 6.93 per cent. lactose, and 3.01 per cent. of fat. The objection to its use is the difficulty of obtaining it and the low proportion of fat present.

The fat-globules of human milk are smaller than those of cow's milk, but aside from this there is no material difference in the cream of the two.

The reaction of human milk is alkaline, while cow's milk is usually acid by the time it reaches the consumer. This acidity is often a source of considerable disturbance in the child's digestion, which should never be allowed to occur, as it is a simple matter to recognize this condition of the milk and correct it.

The following table represents a comparison of human and cow's milk, constructed from the average of a large number of analyses by competent chemists.

Standard Comparative Table of Human and Cow's Milk.—
(CAUTLEY.*)

							Cow's Milk.	Human Milk.
Water,	.	.	.	.	.	.	87	87.46
Solids,	.	.	.	.	.	.	13	12.54
Proteids,	.	.	.	.	.	.	4.06	1.93
Fat,	.	.	.	.	.	.	3.70	3.62
Lactose,	.	.	.	.	.	.	4.48	6.75
Salts,	.	.	.	.	.	.	0.76	0.26
Reaction,	.	.	.	.	.	.	Acid.	Alkaline.

* "The Feeding of Infants."

A great variation is found in the results obtained by different observers in analyses of human milk, the fluctuations in the percentages of proteids and fat being very marked even in the same subject, at times. Rotch cites a case in which the proteids rose from 2.53 to 4.61 per cent. in a wet-nurse, from being fed on a richer diet than she had been accustomed to. Again, one observer will report having found 2 per cent. of proteids, while another finds 1 per cent. In a series of analyses made by A. V. Meigs the proteids varied from .73 to 1.27 per cent.; fat from 2.4 to 9 per cent. In a series of careful analyses recently reported by Hofmann, of Leipzig, the percentages stand as follows: Proteids, 1.03 per cent.; fat, 4.07 per cent.; lactose, 7.03 per cent.; salts, .21 per cent.

This only demonstrates the fact that the human subject is a very sensitive organism, easily influenced by emotional factors, character of diet, amount of exercise, and certain physiological states, such as the recurrence of the catamenia or pregnancy.

Causes Influencing the Composition of Breast Milk.

The milk obtained at the beginning of a milking is known as the *fore-milk*. It is watery and poor in fat. Next comes the *middle-milk*, and lastly the *strippings*. The middle-milk should be used for an analysis when the contents of the entire udder or breast cannot be gotten. The strippings are especially rich in fat, and also contain a higher percentage of proteid than the fore-milk.

The interval at which the breast is emptied markedly influences the composition of the milk. The longer the interval, the more watery the milk and the more frequently the breast is used, the more concentrated the milk becomes. When the bad habit of putting the child to the breast every one or one and a half hours is persisted in there will be a veritable "condensed milk" eventually secreted, which it is needless to state cannot be digested by the infant. It

can be laid down as a maxim that the more frequently the child is nursed, the more indigestible the milk becomes. The over-stimulation of the mammary gland leads to an increased secretion of proteids, while the percentage of fat is also augmented, the milk resembling the *strippings* in this respect.

Food and exercise exert a marked influence upon the composition of milk. The richness of the milk, that is the amount of fat, is increased by a nitrogenous diet, and is decreased by an excess of fatty foods, owing to the diminished metabolic activity induced by such a diet.

The proteids are increased, together with the fat, on a liberal proteid diet; also from increased frequency of nursing, as has been pointed out, and especially when a liberal diet is enjoyed, together with insufficient exercise. This is frequently a source of much trouble with wet-nurses, who, entering upon their new duties with privileges not formerly enjoyed, a diet and sedentary occupation to which they are not accustomed, soon secrete a milk hardly to be distinguished from rich cow's milk in its chemical composition and indigestible character. To correct this condition the nitrogenous food must be considerably cut down and sufficient exercise taken until the percentages become normal.

The effect of alcohol moderately used is not injurious to the milk, and in some instances highly beneficial to the mother. Some of the malt liquors certainly act as galactogogues, and the amount of fat is slightly increased by the use of alcohol. When used in excess, serious gastro-intestinal disturbances in the infant may arise.

Menstruation sometimes induces changes in the milk which cause it to disagree. Rotch reports a case in which the proteids rose to 2.12 per cent., while the fat fell to 2.02 per cent., rendering it difficult to digest and interfering with the regular rate of progress in the child's weight. On the other hand, Schlichter, who made analysis in thirty-three cases of menstruating women, concludes that diar-

rhœa and colic should rather be looked upon as coincidences, for he found no decided alterations in the milk.

Should the mother become pregnant, it is not advisable to continue breast feeding, as the drain upon her system is usually too great to be borne by the average woman, and, beside, there is danger of inducing miscarriage. The child also usually ceases to gain weight progressively, and evinces signs of not being satisfied with the nourishment it gets. If it is, however, necessary to temporize on account of the delicate state of the child and the time of year, it may be suckled to the sixth month, and then partial weaning instituted. This will very rarely be necessary, for with our present knowledge of infant feeding, and the accurate and safe methods at our disposal, the dangers of weaning, formerly so much to be feared, can be reduced to a minimum.

The Modification of Cow's Milk.

It has been pointed out that cow's milk in its raw state is not a suitable infant food for two reasons, namely, on account of the excessive amount of proteids and their indigestible character when compared to those found in mother's milk, and the contamination by micro-organisms so universally present. To overcome the first objection, we must put the milk through a process of modification, in which the percentages of its proximate principles are brought to a standard composition of human milk. Sometimes, however, it will be found necessary to either reduce or increase the percentage of these elements, the necessity and indication for which will be discussed later on.

By referring to the table on page 40, a fair idea of the difference between human and cow's milk can be obtained. Regarding the percentage of proteids in human milk, no fast rule can be laid down, and it has been shown how analysis by different chemists vary, and how strongly diet, exercise and constitutional disturbances influence the composition of the mammary secretion.

The following table represents a fair working basis for this problem :

	Human. Per cent.	Cow. Per cent.
Proteids,	1-2	4
Fat,	4	4
Sugar,	7	4.5
Water,	87	86
Reaction,	Alkaline.	Acid.

Gaertner* of Vienna has devised a practical method of modifying cow's milk to approximate human milk in composition by the use of the centrifuge. Equal parts of distilled water and milk are put into the centrifuge and separated into two portions, one containing all the cream, beside two per cent. of casein. A tablespoonful of sugar of milk is added to each half litre of this "Fettmilch," which renders it very similar in composition to human milk and a very useful food for most infants. Fischer† has recently reported a series of cases, among them entero-colitis, gastro-enteric catarrh and atrepsia, which improved rapidly under a change of diet to this formula. A preparation very similar to this can be made at home by simply allowing the milk to separate by standing, this method having long been in use, and already warmly recommended by Guernsey.‡

It is, however, often not only desirable, but absolutely necessary to vary the percentages of the proximate principles, or closely imitate a given formula, in which case we must have a definite mode of procedure, which at the same time is simple and practical in its application. A method of modifying cow's milk to conform with the indications of each case, which I have used with signal success both in private practice and in my hospital work, has been reported on a former occasion, under the title *The Artificial Feeding*

* "Therapeutische Wochenschrift," Mai, 1895.

† "Medical Record," Dec. 11, 1897.

‡ "Obstetrics," p. 622; Phila., 1867.

of *Infants with Synthetical Milk*.* The manner in which it is carried out is as follows:

In the first place we must have stock solutions of a definite composition at our disposal. Our source of proteids will be skimmed milk. This has been shown to contain very uniformly 4 per cent. of proteids. Beside this, however, it contains 4.5 per cent. of lactose.

Centrifugal cream will be our source of fat. This contains 20 per cent. The best reagent for overcoming the acid reaction is lime-water. Very little of this is required, unless the milk is strongly acid. According to Rotch, one-sixteenth part will render cow's milk of the reaction of woman's milk, under ordinary circumstances. One-fourth of the bulk of the entire mixture has been recommended, but this seems an unnecessarily large quantity.

Lactose being found deficient in cow's milk, an additional supply must be added. It is the carbohydrate element in the milk, and should not be replaced by cane sugar, for physiological reasons. Milk sugar is undoubtedly more assimilable than cane sugar, as the experiments of Bernard tend to demonstrate. It does not undergo alcoholic or butyric fermentation, as cane sugar, and by its lactic acid fermentation aids in the digestion of albuminoids. It is but a precept of common sense to use that which nature offers, for were it intended that the child should have cane sugar it certainly would be found in the milk instead of lactose. But the milk sugar must be a pure and reliable article. Many of the brands obtained in the shops are adulterated with cane sugar, and are said to contain considerable mucus. It would therefore seem safer to recommend a pure crystallized cane sugar, unless we are certain of the purity of the product.

The preparation of a mixture of a definite composition is now only a mathematical problem. We will suppose that we have a case in which we decide upon the following formula:

* "Hahnemannian Monthly," Feb., 1898.

R Proteids,	1.33 per cent.
Fat,	4 " "
Lactose,	7 " "
Reaction,	Slightly alkaline.

As skimmed milk contains 4 per cent. of proteids, it will constitute $33\frac{1}{3}$ per cent. of the total quantity of the mixture. Beside the proteids it contains 4.5 per cent. of lactose, and being diluted two-thirds in this case, it will contribute 1.5 per cent. of lactose toward the mixture, so it will but be necessary to add 5.5 per cent. of lactose to conform to the 7 per cent. of the prescription.

Cream containing 20 per cent. fat, we must use 20 per cent. to furnish the 4 per cent. of fat. So far our calculation reads :

Skimmed milk,	$33\frac{1}{3}$ per cent.
Cream,	20 " "
Lactose,	$5\frac{1}{2}$ " "
Water,	$40\frac{5}{8}$ " "

All that remains necessary now is to substitute a portion of the water with lime-water in order to alkalinize the mixture, and it is ready for use, after, of course, having undergone the process of sterilization.

By adopting the metric system in our calculations any formula can readily be worked out under the above method. When a milk laboratory is available, such as one of the Walker-Gordon Laboratories, branches of which are located in most of the larger cities, it is only necessary to write out the formula and quantity desired in order to furnish the patient with a modified milk.

The Indications for Varying the Percentages of the Proximate Principles of the Infant's Food.

The character of the stool and the rate of progress in the child's weight are the data by which we must be guided in regulating the composition of the diet. Exceptionally breast milk disagrees with the child, the commonest source

of disturbance being the increase in the proteids, as shown in Rotch's case, cited above. The symptoms pointing to this condition are vomiting of large curds, colic, constipation, or diarrhœic stools containing tough curds. If the child persistently indulges in a food too rich in proteids, the uric acid diathesis is likely to develop. On the other hand, a deficiency of nitrogenous food leads to anæmia, a general laxity of the muscular system and a checked physical development.

When fats are in excess, vomiting and diarrhœa may likewise be induced, but the stools will contain fat in considerable quantity. Normal amounts of fat are not disposed of in hepatic and duodenal disturbances, including deficient pancreatic secretion.

A deficiency of fat is very pernicious in its result, laying the foundation for the development of rickets and tuberculous diseases.

The chemical instability of the carbohydrate, of which group lactose, cane sugar and starch constitute the most important members, renders them especially liable to induce trouble, particularly when micro-organisms contaminate the diet. Through their fermentation lactic acid on the one hand and alcohol, acetic and butyric acid on the other are formed in the alimentary tract, and the troublesome summer diarrhœas are largely traceable to this source. Children fed over a long period on foods rich in carbohydrates and poor in fat and proteids become large, flabby, and usually rachitic. They are anæmic and resist acute illnesses poorly—in fact their plump bodies melt down to a mere bony framework, almost as a dropsy might rapidly disappear and leave an emaciated form behind.

The percentages of proteids and fat can be readily modified in breast milk by regulating the mother's diet and habits. Still more readily can these amounts be changed under artificial feeding, when the condition requiring such a change becomes apparent. The amount of lactose

cannot be influenced in human milk. Whenever a breast-fed child shows signs of disordered digestion and impaired nutrition it becomes necessary to examine the milk, in order that the proper correction of the condition can intelligently be made.

The Intervals for Feeding and the Quantity Required by the Child at Different Ages.

The new-born infant is put to the breast as soon as the condition of the mother will allow. Milk is not secreted before the third day, but *colostrum*, which is a fluid rich in cells from the acini of the gland undergoing fatty metamorphosis is present in sufficient quantity to appease the child's craving, and by its gentle laxative property empty the intestinal tract of the meconium. The child may be put to the breast every two hours during the first month, and if it be weakly, or show signs of not gaining progressively in weight, it may be nursed once during the night. Beginning at 5 A.M. and ending at 11 A.M., the child will have received ten nursings in all. During the second month the interval should be extended to two and one-half hours, and again one at night, if necessary. This will make eight nursings from 5 A.M. to 11 P.M. From the third month to the time of weaning, which should only under rare conditions be extended beyond the ninth month, the intervals will be every three hours, thus making seven nursings during the regular time.

These rules should under no circumstances be deviated from so long as the child is not seriously ill, and it is better to let it cry than give the breast before the prescribed time, and awaken it when the time for nursing comes around, until the child forms the habit of regular nursing.

Some authorities recommend even longer intervals than those given above, but it will generally be found that the baby does very well under this *régime*, and where an individual case is found in which a more frequent or a more

extended period seems necessary, it certainly will be the wisest thing to make a change. The regularity of the feeding is the most important element. The advantages of this method over irregular feeding, or the little and often method, are too manifest to merit special discussion.

When the infant is to be raised by hand from the beginning, it is well to commence with a 5 per cent. solution of milk sugar, sterilized, one ounce every two hours for the first day, until the bowels have been completely emptied and the child is taking the liquid well. It can then be put on a mixture containing about .80 per cent. proteids, 2 per cent. fat and 6 per cent. lactose; this is gradually increased as the child's digestion becomes stronger, until it is taking a formula corresponding to mother's milk.

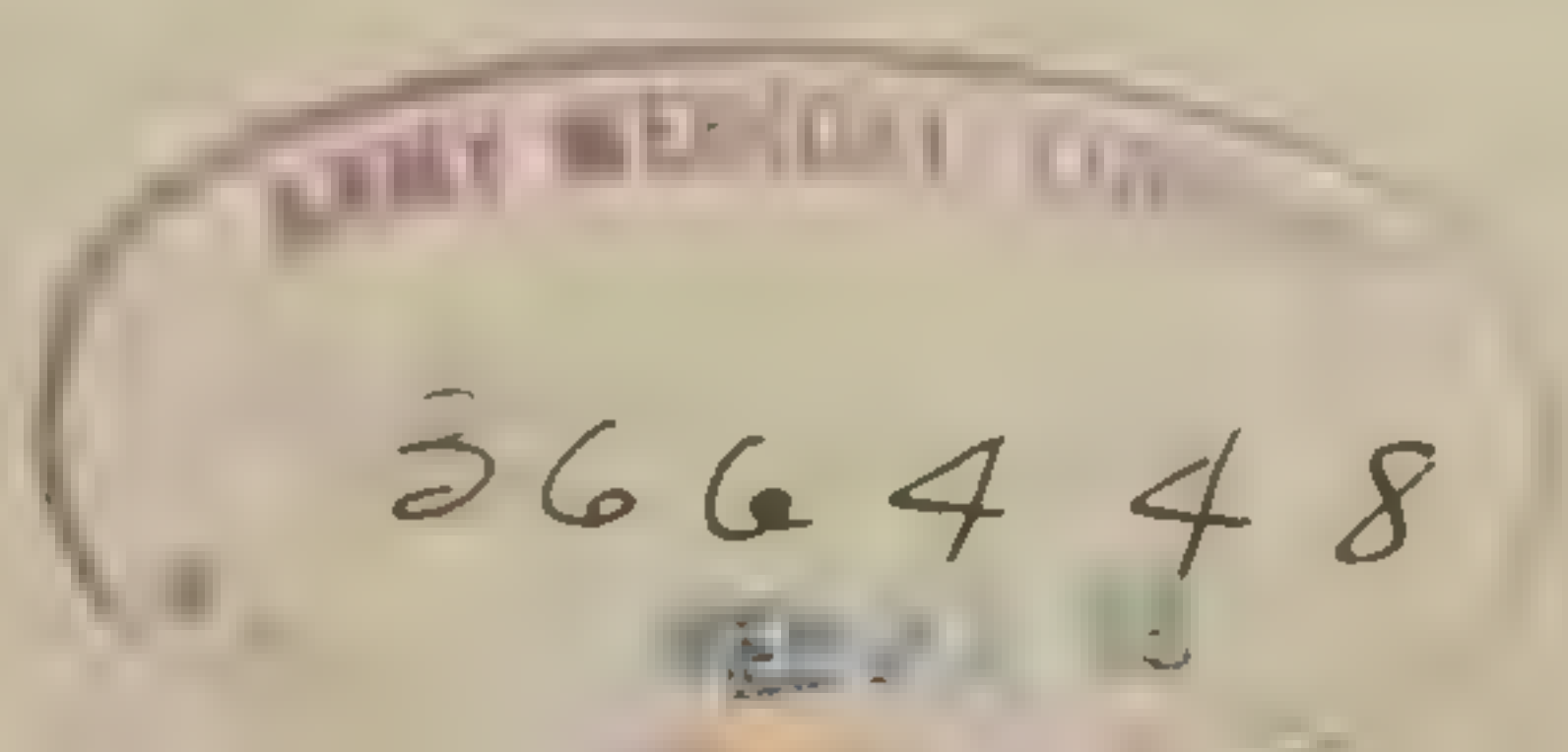
In regard to the quantity to be given at a feed no fast rule can be laid down, for stomachs vary in size in children of the same age and weight, and a child of five months may have the feeding capacity of another at seven months. It has been estimated that the stomach capacity is equal to one-hundredth of the child's weight; Frowlowsky giving the following measurements :

One week, 1 ounce ; four weeks, $2\frac{1}{2}$ ounces ; eight weeks, $3\frac{1}{5}$ ounces ; twelve weeks, $3\frac{1}{3}$ ounces ; sixteen weeks, $3\frac{4}{7}$ ounces ; twenty weeks, $3\frac{3}{5}$ ounces.

The capacity of a hand-fed babe is, however, usually greater than the above, and the increase after the first month is more rapid than this table would indicate.

From a comparison of the measurements of Caillé and Frowlowsky and the experiences of Rotch, Fleischmann, Cautley, Holt and others, it is possible to construct a table such as the one below, which can be used in a routine manner as a guide in regulating the infant's feeding, modifying it to suit individual cases when necessary.

In preparing a modified milk the entire twenty-four-hour quantity (in cubic centimetres) may be prepared at one time, sterilized, and placed on ice, warming the bottle by placing it in warm water just before using.



	Quantity.		No. of Feeds.	Total Quantity.		Intervals.	Time.
	C.c.	Oz.		C.c.	Oz.	Hrs.	
1 week.....	30	1	10	300	10	2	5 A.M. to 11 P.M.
2-3 weeks.....	45	1½	10	450	15	2	
4 weeks.....	60	2	10	600	20	2	
2 months.....	90	3	8	720	24	2½	
3-4 months ...	120	4	7	840	28	3	
5-6 months....	150	5	7	1050	35	3	
7-9 months....	180	6	7	1260	42	3	
10 months.....	200	6⅔	6	1200	40	3½	
12 months.....	240	8	5	1200	40	4	

The Sterilization of the Food.

The first milk secreted from the human breast may contain a few varieties of staphylococci, as demonstrated by Cohn and Neumann, these micro-organisms having gained access to the milk-ducts through the nipple. After the breast has been thoroughly drained, the micro-organisms are flushed out of the ducts, and the milk is then usually quite sterile. Where, however, the breast is diseased, there may be an abundance of bacteria constantly present in the milk, as is the case in mastitis, especially the parenchymatous variety, and in tuberculosis affecting the mammary gland. Under such conditions it is absolutely imperative to institute weaning.

Cow's milk is practically never sterile; indeed, not only diarrhoeal diseases are brought on by the use of infected milk, but epidemics of cholera, scarlet fever, typhoid fever and diphtheria, beside infection with tuberculosis and foot and mouth disease, have been traced directly to the milk supply.

Of this group, cholera infantum and gastro-enteritis, respectively designated acute and subacute milk infection by Vaughan, and tuberculosis, are most to be feared, as they are so constantly traceable to the method of feeding.

Regarding the last-named disease, it was formerly taught that tuberculous cows yielded milk containing tubercle bacilli, whether or no the udder was affected; but the re-

cent researches of Lewis Woodhead and Sidney Martin demonstrate that only milk from a cow with tuberculous udders is infectious.

Woodhead proved also that the temperature usually recognized as capable of destroying the tubercle bacillus, namely, 75° C., for a period of ten minutes, was not sufficient to render this micro-organism innocuous; and even when exposed twice that length of time, tuberculous milk produced in pigs a modified form of tuberculosis, manifesting itself as chronic tuberculous glandular and joint affections, analogous to scrofulosis.

It is, therefore, highly important that all micro-organisms should be destroyed. Thoroughly boiling the milk for five minutes renders it absolutely sterile from the clinical standpoint.

Pasturization is practiced by immersing the bottle containing the milk into a receptacle holding water to a level of the milk in the bottle. The water in the receptacle is brought to the boiling-point; the bottle, stoppered with sterilized absorbent cotton, becomes highly heated in the boiling water, and, the source of heat having been removed, or, better, the vessel placed in the back portion of the stove, it is allowed to simmer for half an hour, when the bottle is rapidly cooled under a jet of water and placed on ice. By this process the milk has been brought to a temperature of 70 to 75° C., and maintained at that heat for half an hour, which is sufficient for all practical purposes.

A more convenient apparatus is the Arnold steam sterilizer, in which six bottles can be prepared at once, steam being the source of heat.

Objections have been raised against the use of sterilized and boiled milk, claiming that it is less digestible than raw milk, and that its anti-scorbutic property is destroyed by these processes, which may render its prolonged use not entirely without danger. By a careful watch over the child, however, and the judicious and occasional use of fruit

juices, this contingency can be averted. II. Lahmann* believes that scurvy and rickets developing in infants fed on sterilized milk are due to the exclusive milk diet, and not to the process of sterilization. Milk contains too small a percentage of iron, soda and lime, and to remedy this defect he adds fruit juices to the dietary. The juice of oranges, cherries, strawberries and other fruits is recommended, and after the third month they can be given with impunity.

The Preparation and Indication for Other Foods and Adjuvants to the Child's Dietary. Artificial Foods.

Barley-Water.—This is a most useful adjuvant in the treatment of many conditions peculiar to infants. According to a series of experiments by Cautley, a weak barley-water will render the curds of milk, when precipitated by acetic acid, much finer than is the case with any other diluent. It is a bland, demulcent liquid, possessing some nutritive properties, mainly from the presence of starch. It should therefore be used continuously until the amylolytic functions of the child have been developed. Being demulcent, and containing a carbohydrate element which is not so favorable a medium for the development of micro-organisms as nitrogenous elements, it is especially serviceable in the acute summer diarrhœas of infants, either as an attenuant of the milk or when given pure. It is best made as follows: "Take two ounces of pearl barley and wash well with cold water, rejecting the washings. Afterwards boil with a pint and a half of water for twenty minutes in a covered vessel, and strain."—(PAVY.)

Rice-Water.—This is a very nutritious, soothing drink in acute intestinal troubles. "Thoroughly wash one ounce of rice with cold water. Then macerate for three hours in a quart of water kept at a tepid heat, and afterwards boil slowly for an hour, and strain."—(PAVY.)

* "Allgem. Med. Central. Zeitg.," lxx., 1896.

Rice-Paste.—Dr. George B. Fowler (“N. Y. Med. Record,” No. 12, 1890) highly recommends a paste, made by adding four tablespoonfuls of rice to three pints of water, boiling half an hour and then setting aside to simmer, water being occasionally added to maintain the three pints. This is strained through a colander and cooled, when a paste is formed. Three tablespoonfuls of the paste are added to half a pint of sterilized milk. Dr. Alonzo Barnes of this city has had excellent results from this preparation in summer-complaint.

Oatmeal-Water.—This is contraindicated in diarrhœal affections, but is useful as a diluent in constipation. A tablespoonful of oatmeal is added to a pint of water and brought to the boiling-point under constant stirring. It is then set aside, allowed to cool, and strained.

Albumen-Water.—This is a highly nutritious, easily digested drink, and is often retained where the stomach rebels against more substantial forms of food. “Take the white of a fresh egg and cut it in various directions with a clean pair of scissors. Shake it up in a flask with a pinch of salt and six ounces of pure cold water. Strain through muslin.”

Beef Tea.—It is needless to mention here that beef tea contains no virtue beyond its stimulating effects. It is useful in low, febrile conditions and where there is lack of reaction. In order to render it nutritious, beef pulp or a cereal must be added.

Chicken- and Mutton-Broth.—These broths are less stimulating than beef tea, but are better tolerated where there is much fever. Chicken broth contains some gelatin.

Beef Juice.—When properly prepared, this is a highly nutritious albuminous form of food. It is an excellent food in anæmia and where the digestive powers are weak, but lithæmic symptoms must be watched for when this food is used over an extended period. To obtain the juice, a piece of sirloin steak, or any good piece of beef from which the

fat and connective tissue have been removed, is quickly broiled in a hot pan, placed in a strong lemon squeezer, or, better still, the beef press especially made for this purpose, and the juice completely squeezed out. It may be served warm with seasoning or on bread; also diluted with ice-water. Boiling coagulates the myosin and serum albumin, and renders the product less digestible.

Junket is often useful to vary the monotony of a milk diet. It can be prepared with rennet or Fairchild's essence of pepsin.

Peptonized Milk.—This is a most satisfactory food in low typhoid states and sometimes in dyspeptic cases, used until the digestion has regained its normal condition. For rectal feeding it is extremely valuable. The milk used for this purpose must not be rich in cream.—(GILMAN THOMPSON.) The quickest and most satisfactory method of preparing it is to dissolve the contents of a Fairchild's peptonizing tube in four ounces of cool water, adding a pint of milk. The bottle containing the mixture is placed in hot water of a temperature that can be borne by the hand for a minute without discomfort (STARR), and allowed to remain thirty minutes. If this renders it too bitter, it should be removed earlier.

Malt Diastase—Liebig's Food.—Ground malt possesses marked diastatic properties, and, when added to a starchy food, converts the latter into maltose. Malt extracts have the same power, but to a less degree. In amylaceous dyspepsia the child's farinaceous food, such as oatmeal, rice, cracker-paps and flour soup, should be sweetened with a malt extract instead of cane sugar. It can also be given alone before meals. Liebig's food contains gluten and albumin of flour and barley, dextrin and maltose. It is prepared as follows: "Mix a half-ounce each of ground malt and wheat flour, seven and one-fourth grains of potassium bicarbonate, with one ounce of water and five ounces of sweet cow's milk. Warm slowly and stir until thick.

Remove from fire, stirring for five minutes; replace over fire and remove when quite thick.”—(GILMAN THOMPSON.) This mixture becomes thin and sweet as the diastatic process becomes completed, when it is again boiled and strained. Fothergill is a great advocate of ground malt. He recommends it in addition with baked flour and hot milk. *Maltine* is a very stable article, and, beside being a digestive agent, is rich in phosphorus and highly nutritious. When a mild stimulant is indicated, a liquid preparation, such as *Hoff's*, is very useful.

Baked Flour.—Through the process of baking the starch-granules are burst, and some of the starch is converted into dextrin, making it, on the whole, more digestible. A water-cracker is a good example of baked flour, but it contains some lard, which is necessary in the process of manufacture. As most infant foods are deficient in fat, it is rather an advantage than otherwise; and if these crackers are rolled to a fine powder, stirred to a paste with cold water, and boiled with sufficient milk to make a thin pap, we have here a highly-nutritious food, easily digested by most babies after the sixth month. It can be sweetened with a malt preparation, which will prevent constipation resulting. Comparing this food with the artificial foods flooding the market, we can readily see that the only advantage they have over simple home methods of preparing foods is the rapidity with which they are made and the saving of a little trouble. They are expensive, usually insufficiently nutritious, not always conforming to the formula advertised by the manufacturer, and, although they will save the mother a little trouble for the time being, she will be fortunate indeed if the expense and worry attached to the development of scrofulous, tuberculous and rachitic disease be spared her at a later date.

Fruit Juices.—In a previous chapter the necessity of using fruit juices where there is a tendency to scurvy and rickets was pointed out. Where fresh fruit cannot be

obtained, the sweetened juice of dried plums, apples, apricots and the like can be used. In constipation they are often called for.

Fat—Cod-Liver Oil.—It may be that fat has been insufficiently supplied in the child's dietary, or that the child cannot properly digest and assimilate it. In the latter case cod-liver oil often comes to the rescue. It is best given as recommended by Fothergill, *i.e.*, taken about an hour after eating, when the food passes out of the stomach into the duodenum. In this way it does not needlessly provoke the stomach, and the disagreeable eructations are avoided. Sometimes an emulsion acts better than the pure oil.

The marrow from a shin-bone spread on bread while hot, and a little salt added, is an excellent food for anæmic children. Fat is the necessary food in struma and rickets. Butter-taffy is a pleasant way of supplying fat when cod-liver oil is refused, and is highly praised by Fothergill.

Stimulants.—Brandy, well diluted, is the best alcoholic stimulant. Beginning with half an ounce, the quantity can be increased to one and one-half ounces in twenty-four hours for a child under one year. I have often substituted alcohol sponge-baths (one part of alcohol to three parts water), and a compress of dilute alcohol applied to the abdomen, for the internal administration of alcohol, with entire satisfaction. Eggnog is sometimes indicated; malt extracts have been referred to.

Artificial Foods.—Any one who has taken the trouble of acquainting himself with the method of modifying cow's milk to resemble human milk in composition, and has observed the results obtained from this method of feeding, and also has studied the simple methods of preparing suitable articles of diet for the child in health and disease, as detailed above, must fail to see any special necessity for the numerous proprietary foods so extensively used and advertised. And yet there is a field for them; there are times when it is extremely convenient to have an article at com-

mand requiring simply the addition of hot water or milk for its preparation, at the same time knowing that we can rely on it and get results. The mistake is to use any prepared food over a prolonged period, for then the mischief is done; if we employ them with judgment, they are very useful. For example, *Horlick's Malted Milk* is often retained when other food is vomited; it requires simply the addition of boiling water in its preparation, and will sustain life for a long period of time. It is therefore an excellent food to be used in travelling and in some acute conditions. A cup of hot malted milk at bedtime is conducive of a restful night's sleep—a marked peculiarity of this food.

Condensed Milk contains too much sugar and too little fat to be a suitable infant's food, being only permissible in case of emergency. Evaporated milk, without the addition of sugar, prepared from a milk rich in fat, is a much better substitute for fresh milk, the Romanshorn brand (a Swiss product) being a particularly good and reliable article.

Mellin's Food is a Liebig Food and can be used when it is not convenient to prepare the Liebig food at home. It is useful in constipation, and is very fattening. When made according to the directions it closely resembles mother's milk, but it must be remembered that the cow's milk which is added to this food is the main factor in the formula.

Nestle's Food is a good preparation, but has no advantage over the cracker-pap described above. It contains evaporated milk, however, and consequently only requires water in its preparation, but being notably deficient in fat, like all other artificial foods, will never rear a perfectly healthy baby.

Artificial foods, therefore, have their place; they are never absolutely necessary, only being a convenient contrivance of our progressive age, and they can never supplant mother's milk or a milk modified by strictly scientific methods to resemble the human product.

CHAPTER V.

DISEASES OF THE NEW-BORN.

A VARIETY of conditions may be observed in the new-born, resulting either from mechanical injury or from infection. Certain physiological changes taking place in the organism may also give rise to disturbances peculiar to this period of life; these are notably asphyxia, cyanosis, and icterus.

Asphyxia of the new-born may be of either intra- or extra-uterine origin. Intra-uterine asphyxia results from interruption of the placental circulation through compression of the cord or premature separation of the placenta. Respiratory efforts are excited in the child through the resulting carbonization of the blood and the lungs become filled with amniotic fluid.

Extra-uterine asphyxia is in the majority of cases only a symptom of pial hemorrhage, the irritability of the respiratory centres being abolished through the intra-cranial pressure. In the absence of hemorrhage, malformations of the respiratory or circulatory organs, pulmonary atelectasis, pulmonary syphilis, pneumonia or premature birth may be the cause.

The results of asphyxia are stagnation of dark, fluid blood in the veins and filling of the right ventricle, hyperæmia of the various organs, and petechial hæmorrhages.

According to the degree of asphyxia, these cases have been divided into the *sthenic* and the *asthenic variety*. In the former the skin is of a livid color, the face appears bloated; the reflexes are, however, not abolished, and the pulse is slow but perceptible. This variety presents a better prognosis than the asthenic, in which there is pallor of

the body surface, abolition of reflexes, and imperceptible pulse.

The *treatment* consists in the removal of all obstruction, such as mucus and amniotic fluid from the air-passages, supplemented by measures calculated to set up respiratory efforts through peripheral irritation. The alternate warm and cold bath is very efficacious in this direction. In the asthenic variety the warm bath alone should be employed, together with artificial respiration.

Cephalhæmatoma.—A cephalhæmatoma is a tumefaction situated upon one of the cranial bones, usually the parietal, resulting from hæmorrhage beneath the periosteum. They result from injury sustained during parturition, being especially found when there is a narrow pelvis. Being entirely external they produce no symptoms, the clot becoming organized and absorbed in the course of several weeks. They are usually noticed a few days after birth and may be confounded with *hernia cerebri*, but the latter is most frequently situated either at the root of the nose or nape of the neck, and presents a distinct bony edge, indicating the opening from which it protrudes. It requires no treatment.

Intra-cranial Hæmorrhages.—Apoplexy of the newborn appears as a venous or capillary hæmorrhage of the meninges of the brain, less frequently occurring into the cortex, resulting from direct injury sustained during birth. This condition is fully discussed under the *cerebral palsies*. Other forms of injury to the nervous system encountered at this period are *facial* and *brachial paralyses*, resulting from pressure or traction upon the nerve trunks supplying these parts.

Tetanus Neonatorum.—The bacillus of tetanus may gain entrance through the umbilical cord or through abrasions of the skin, and induce the identical symptoms of tetanus observed in the adult. The earliest manifestations, rigidity of the jaws, may occur during the first ten days of

life. This is followed by tonic spasms of the muscles of the neck and extremities, coming in paroxysms. It usually terminates fatally within a few days, although it may pursue a protracted course and result in ultimate recovery.

Treatment.—The region of the umbilicus should be dressed with gauze wrung out of a one to two thousand bichloride of mercury solution, in order to check further progress of the infection. *Hypericum* may be tried with the hope of influencing the course of the disease. Other remedies which have been recommended are *bell.*, *cicuta*, *hydrocyanic acid*, *lachesis*, *nux vom.*, *physostigma* and *stramonium*.

The *antitoxin* of tetanus has not displayed a perceptible advantage over the older methods of treatment of lockjaw. Although we hear of success following its employment, we hear of and see an equal number of total failures. It is to be hoped that further development of this form of treatment will give the same results seen in diphtheria, but at present the outlook in a case of tetanus is as gloomy as ever.

Septicæmia.—Septic infection through the umbilical cord, abrasions of the skin or mucous membranes, or through the lungs, is not common in private practice, but it frequently occurs epidemically in institutions, similar to puerperal fever. Infection may also occur *in utero*.

When the condition originates in the umbilicus there will be found arteritis and phlebitis of the umbilical vessels, phlegmon of the surrounding tissues, and gangrene of the navel.

The *symptoms* are a rapidly-progressing collapse, with high temperature and blood changes. The blood is dark and fluid, and the body may present a jaundiced hue. Petechial hæmorrhages and destructive changes in the skin and mucous membranes, especially at the seat of infection, will be found. The *prognosis* is most grave.

Arsenicum, lachesis, rhus tox. and *merc. cor.* are the chief remedies.

Acute Fatty Degeneration, or Buhl's Disease.—This disease was first described by Buhl in 1860, and presents parenchymatous inflammation, fatty degeneration and hæmorrhages in the heart, liver and lungs. It is probably of infectious origin. It is rare, and is only seen in lying-in hospitals. The children are usually born asphyxiated, and they do not entirely recover from this state. Cyanosis supervenes, and they either die at this time, or the course becomes more protracted, and bloody diarrhœa, hæmorrhage from the navel, mouth, nose and conjunctiva, and icterus, set in. Later, œdema of the skin occurs, and death from collapse follows about the end of the second week. The *diagnosis* can only be positively made by a microscopic examination of the organs. The *prognosis* is always fatal.—(EARLE.)*

Acute Hæmoglobinuria, or Winkel's Disease.—In 1879 Winkel encountered a series of twenty-three cases of hæmoglobinuria occurring in the new-born, associated with cyanosis, icterus, and hæmorrhages in the various organs, with a fatal termination in thirty-two hours in the average of cases. The cause is unknown, but it is undoubtedly an infectious disease. Other cases have been reported, but not in such an extensive epidemic as the above.—(WINKEL.)†

Ophthalmia Neonatorum.—The violent conjunctivitis of the new-born, resulting frequently in destruction of the entire eye, is the result of an infection with the virus of gonorrhœa contracted during parturition. The first symptoms develop on about the third day, presenting swelling and redness of the palpebral and ocular conjunctiva with a profuse catarrhal secretion, which rapidly becomes purulent. Unless promptly checked the condition assumes a grave aspect, and extensive corneal scars, with consequent blindness, are frequent sequelæ.

* "Amer. Text-Book of Obstetrics."

† "Lehrbuch der Geburtshülfe."

The *treatment* is mainly prophylactic. Whenever a suspicious vaginal discharge is present the infant's eyes should be immediately flushed with a saturated solution of boric acid, followed by the instillation of a drop of a 2 per cent. solution of nitrate of silver into each eye, according to the method of Credé. If ophthalmia has developed, frequent flushings with boric acid or permanganate of potash solutions in conjunction with the silver and cold compresses should be employed. *Arg. nitr.* may be administered internally at the same time.

Mastitis.—Inflammation of the mamminæ with abscess formation is a common result of squeezing out the breasts in a rough manner. In the new-born there is frequently present a cholostrum-like secretion, and any form of mechanical irritation of such a breast is liable to result in inflammation and suppuration. Under the use of hot fomentations and the administration of *bell.* or *bryonia*, followed by *hepar*, resolution is the usual result.

Icterus Neonatorum.—Icterus may occur symptomatically as a hæmatogenous jaundice in septicæmia, Buhl's disease and Winkel's disease, or it may be due to congenital or syphilitic stricture of the hepatic duct.

A *physiological icterus* occurring several days after birth, disappearing spontaneously after a week, is observed in from 79 to 84 per cent. of all infants.—(PORAK, CRUSE.) It is most liable to occur when birth has been premature, or if ligation of the cord has been delayed. According to Birch-Hirschfeld, swelling of the capsule of Glisson takes place from interruption of the circulation in the umbilical vein, resulting in pressure upon the biliary ducts and causing a hepatogenous jaundice. Hofmeier is of the opinion that the icterus is hæmatogenous in origin, depending upon an extensive destruction of red blood corpuscles, a process which takes place in the liver most actively at this period of life. No doubt a combination of both of these causes is active in the majority of cases.

Medicinal *treatment* is not required, as the process is a purely physiological one and produces no disturbances. Catarrhal jaundice may, however, occur early in life, and requires special attention. (See Chapter VIII.)

Gastro-Intestinal Hæmorrhage, or Melena.—Hæmorrhage from the stomach and bowels may take place shortly after birth, and terminate fatally within a few days. These hæmorrhages may result from congestion and slight erosion of the mucous membrane of the lower bowel (as a result of thrombosis of the umbilical blood-vessels or asphyxia), follicular ulceration of the stomach and intestines, or from a round, perforating ulcer, and also from many of the infections above mentioned and other constitutional disturbances. The possibility of follicular ulceration of the stomach and bowels existing in infants who have died suddenly without having displayed any of the symptoms of melena, either as the vomiting of blood or the passing of bloody stools, has been impressed upon me on several occasions by post-mortem findings. The pathology of this condition is more fully described under the *Diseases of the Stomach*.

CHAPTER VI.

DISEASES OF THE MOUTH.

Dentition.

THE period of dentition is the time during which the milk teeth make their appearance, and extends normally from the seventh month to the second year. The period of second dentition begins with the sixth year and is usually completed before puberty, with the exception of the eruption of the wisdom teeth, which may appear as late as the twenty-first year. The term "teething" applies to the first dentition period, and embraces the various disturbances occurring at this time, when they can be directly traced to the teething process.

Six to eight months after birth the two lower central incisors should make their appearance; the upper central incisors are usually a month later. The upper lateral incisors are the next in order, and at the end of a year the upper anterior molars should appear. At the fourteenth month the lower lateral incisors erupt, followed by the lower anterior molars.

The canine teeth appear between the sixteenth and twentieth months, and at the end of the second year the posterior molars are added to complete the set.

Soon after the eruption of the milk teeth absorption begins, commencing at the apex of the root and extending to the crown, so that they are either lost by an accidental tearing of the membranous attachment to the gums, or are displaced by the advancing permanent teeth.

Dentition is a purely physiological process, and can therefore run a normal, uneventful course. This, however,

is unfortunately not always the case, and those who deny the possibility of a pathological condition arising from difficult or abnormal dentition do so simply from an unwillingness to recognize the relation between cause and effect so manifest in these cases. It is true much harm has been done by the lazy routine of attributing every ailment of infancy to "teething," or, finding the child in the act of cutting a tooth, neglecting to investigate any further into the case, whereby many a pneumonia, meningitis, gastro-enteritis and the like has been overlooked, and another child sent "over the hill to the cemetery." But, notwithstanding all this, teething is responsible for many disturbances, either directly or indirectly. It is hardly necessary to refer to the swollen, sensitive gums, the salivation, anorexia, irritability and slight fever, especially when several teeth are making their appearance at the same time, and when the gums are abnormally tough. Although lancing of the gums is to be generally condemned, still when the cusps of the molars are distinctly advanced beneath the mucous membrane and only delayed in making their appearance by the resisting state of the same, the use of the lance is imperative, and will give immediate relief.

The disturbances induced indirectly are mostly reflex, although the changes occurring in the shape of the lower jaw have a direct influence upon the floor of the middle ear. Through the chorda tympani nerve the buccal cavity is brought into close communication with the facial extremity of the Eustachian tube and the middle ear. Cooper* remarks upon the frequency with which children develop a discharge from the ear every time they cut a tooth. There are many other apparently unexplainable "coincidences" involving other regions of the child's economy that occur during teething, which are not as ridiculous or as miraculous as they may seem if they are properly interpreted.

* "Clinical Lectures Upon Inflammations of the Middle Ear."

A later event to be encountered is the decay of the teeth. The relationship of enlarged tonsils, cervical adenitis, dyspepsia, and other affections to carious teeth, is too well established to merit special discussion.

Treatment.—The hygiene of the mouth is of prime importance in preventing and ameliorating the local manifestations. Cleansing the gums with a soft linen cloth dipped in plain cold water should be resorted to frequently, especially before and after nursing. An occasional drink of cold water will serve the double purpose of cooling the gums when there is gingivitis and mitigating the febrile phenomena. One of the following remedies will be found efficient in meeting the local and general symptoms.

Bell. and *cham.* are perhaps the most frequently employed remedies in teething disturbances, *chamomilla* being indicated by the irritable temper, the greenish, offensive diarrhoea, and circumscribed redness of the cheeks, and *belladonna* when there is cerebral hyperæmia, high fever, and tendency to convulsions. The gums are red and swollen.

Ferrum phos. is especially useful when the respiratory tract becomes involved, indicated by rapid breathing, hard, dry cough, hoarseness, great restlessness. *Acon.* is very similar.

Terebinthina. This remedy was first recommended by Cooper,* and it has proven very valuable in my hands. When there is great restlessness at night; interstitial distention of the gums; symptoms of intestinal irritation, such as starting and twitching during sleep, gritting of the teeth and picking the nose, *terebinthina* is strongly indicated and acts promptly.

The *calcareas* are very useful during this stage, especially as constitutional remedies. The *carbonate* is indicated in children teething too rapidly, and follows well after *belladonna* in the acute conditions. The *phosphate* is more

* *Loco cit.*

suited to emaciated or rachitic infants with open fontanelles, slow in teething, and where the teeth decay rapidly.

Stomatitis.

The term stomatitis is applied to the several forms of inflammatory affections involving the mucous membrane of the buccal cavity. It is a common affection among children, and can be traced to various causes, each of which will be fully discussed under its different varieties.

Catarrhal Stomatitis.

This form of stomatitis presents an acute diffuse inflammation of the mucous membrane of the mouth.

Etiology.—The exciting cause is usually some form of local irritation, such as unclean nipples; improper food, or giving the food too hot; infection of the mouth with various micro-organisms, made possible by lack of proper cleanliness. The predisposing factor is, in the vast majority of cases, gastro-intestinal derangement. Hot weather and artificial feeding are therefore responsible for most cases of stomatitis. The scrofulous diathesis, with its tendency to catarrhal inflammations of all mucous membranes, is usually present, and in such cases difficult dentition may be the exciting cause.

Symptomatology.—Primarily there is heat and dryness of the mucous membrane of the mouth and gums, together with redness and swelling. This is generally uniform, although it may be more marked in circumscribed areas. Later there is increased secretion of mucus and saliva, which generally dribbles from the mouth. Pain is present, and the pathognomonic symptom, "The child seizes the nipple eagerly, but after a few pulls at the breast drops it with a cry," is explained by this exquisite tenderness of the mouth. The child is fretful and feverish, and, owing to the inability to nurse successfully, soon loses in weight. Diarrhœa and vomiting must rather be considered

as concomitants of the general condition than as a direct result of the stomatitis. It is usually of short duration, and does not terminate in ulceration.

Pityriasis Linguæ

Is a chronic catarrhal inflammation involving the upper surface of the tongue, resulting in the characteristic condition known as *lingua geographica*. It begins as a circular patch or patches of epithelial hyperplasia forming elevated whitish spots, which enlarge and ultimately begin to desquamate in the centre, forming irregular plaques, with islands of normal mucous membrane interspersed among the hyperplastic epithelium. Several of the ring-like lesions coalesce and form the geographical maps giving the disease its name. This affection shows great tendency to recur, the interval between the disappearance of the old lesions and the reappearance of a new annular patch being usually of short duration. It is met with in children of all ages, in the healthy as well as sickly, although perhaps most frequently in the rachitic.

Aphthous Stomatitis.

Aphthous stomatitis is a vesicular inflammation of the mucous membrane of the mouth, resulting in localized erosions.

Etiology.—The etiology of this affection is not well understood, unless it be considered as a more pronounced form of the catarrhal variety resulting in vesication. Forchheimer, Holt and others consider it of neurotic origin, and prefer the term herpetic stomatitis. Filatow* believes it to be of infectious origin, as it often attacks several children in one family simultaneously. It is most commonly met with in children of one year and over.

Pathology.—Together with a diffuse catarrhal inflammation there is vesicle formation, destruction of the vesicle,

* "Lehrbuch der Kinderkrankheiten."

and superficial erosion resulting at the site of the vesicle. These erosions usually have a yellowish or dirty-grayish base consisting of a fibrinous exudate and epithelial débris. The lesions are surrounded by a red areola, and several may coalesce, forming irregular superficial erosions. They heal by a skinning over of the epithelium from the periphery and leave no scars.

Symptomatology.—The general symptoms of stomatitis, together with the characteristic lesions described above, make up the clinical picture. There is more pain than in the catarrhal form. The lesions are most frequently located on the tongue, the inside of the lips and of the cheeks, and in some instances they are found on the palate and in the pharynx. The breath is not foul, as in ulcerative stomatitis, and the course is usually of short duration, although it may be self-prolonging by the interference with nutrition. The saliva I have usually found to be acid in these cases.

Bednar's Aphthæ.

This is a condition which must be distinguished from aphthous stomatitis, being only found in children between the ages of two days and six weeks, characterized by the formation of a round, superficial ulcer, one situated at each angle of the palate. The *prognosis* is usually favorable in this disease, although deep ulceration of the tissues has been observed.

Aphthæ Epizooticæ.

An infectious form of vesicular stomatitis, resulting from the use of unsterilized milk from cows affected with the disease. There is more fever than in aphthous stomatitis, salivation and coryza accompany the other symptoms, and the vesicles do not appear on the dorsum of the tongue or pharynx, but are usually situated on the soft palate, lips, gums and cheeks. There is also fetid breath, sometimes vomiting and diarrhœa. It runs its course in from one to two weeks.

In *varicella* vesicles often appear in the mouth, but they seldom break down, and the cutaneous manifestations are sufficient to differentiate it from aphthous stomatitis.

Ulcerative Stomatitis ; Putrid Sore Mouth.

This variety presents an inflammation of the mucous membrane of the mouth, accompanied by ulceration.

Etiology.—The destructive inflammation of ulcerative stomatitis is due to a local infection. Although it has occurred epidemically, no specific micro-organism has been demonstrated, and it seems that the ordinary pyogenic bacteria will induce the disease when they find a soil favorable to their propagation. We can therefore understand how lack of proper cleanliness of the mouth and an enfeebled constitution, with unhygienic surroundings and improper nourishment—perhaps a scorbutic state—will invite the outbreak of an attack of ulcerative stomatitis. It may also result from the abuse of the metallic drugs, notably mercury, and never develops until dentition is well established.

Pathology.—The morbid process begins with an inflammation of the anterior border of the gums, most frequently on the lower jaw. Redness and swelling are the initial changes, after which a yellow line, indicating the beginning of the necrotic process, develops along the alveolar border and extends downwards. From the gums the process extends to the inner margin of the lips, and large ulcers are generally formed on the lining of the cheeks opposite to the molar teeth. The sides of the tongue frequently participate, becoming infected by direct contact with the lesions.

Symptomatology.—In the beginning of the disease there are the usual symptoms of stomatitis, but soon the characteristic foul breath develops, the pain becomes intense, and prostration and fever is more marked than in the other forms. This is easily understood when we consider the severity of the process and the autointoxication

which must result from the absorption of the putrid material forming in the mouth. Under proper treatment it may be eradicated in the course of a few days, although the *prognosis* must remain guarded in frail constitutions, or where the ulceration affects the deeper structures and there is general systemic involvement, as indicated by a continued high temperature; rapid, weak pulse, and lymphatic enlargement.

Parasitic Stomatitis; Thrush.

Parasitic stomatitis is an affection of the mouth due to the development of a parasitic fungus within the mucous membrane, and is characterized by the appearance of milk-white patches which are difficult to remove and have a tendency to coalesce and spread extensively.

Etiology.—The *saccharomyces albicans*, a fungus of the group *saccharomyces*, is found in the mucous membrane wherever the lesions develop. If a portion of the white pellicle be removed and placed on a slide with a drop of liquor potassæ the mycelium and the spores can be readily made out.

Artificial feeding by careless methods, early life, exhausting diseases, catarrhal stomatitis, insufficient salivary secretion, unsanitary surroundings and lack of proper care are all prominent etiological factors. The disease can be communicated directly from one patient to another, and is quite common in foundling asylums and among the poorer classes.

Pathology.—The spores of the *saccharomyces albicans*, finding their way into the mouth of the infant, soon develop their mycelia, which penetrate the layers of the mucous membrane and form the white patches or elevations so characteristic of the affection. These patches are difficult to remove, as they are within the mucous membrane, but there is no exudation or pus formation accompanying the process. The lesions usually begin as small white points on the inner surface of the cheeks, quickly spread and

coalesce, so that in a short time the entire buccal cavity and pharynx may be involved. Extension to the œsophagus is rare, and to the stomach still rarer, as it confines itself almost exclusively to the squamous epithelium. Rare cases, however, are on record in which these localities were affected, beside also the lower rectum, the female genitalia, the upper respiratory tract, intestines, and abraded cutaneous surfaces.

Preceding the outbreak of thrush the mucous membrane of the mouth is hot and dry; later there is a sticky mucous secretion acid in reaction. This is partly due to a lack of the normal alkaline salivary secretion, and to saccharine fermentation, the result of the growth of the fungus.

Symptomatology.—Beside the objective symptoms already described there is generally a painful condition of the mouth, due to the catarrhal stomatitis set up by the fungus. As thrush is seldom a primary affection, as a rule developing during the course of some acute gastro-intestinal disorder or a more chronic exhaustive disease, it cannot be said to have many symptoms of its own excepting the objective manifestations. The *prognosis*, therefore, depends upon the accompanying condition, and ordinarily it is very favorable; but in an enfeebled constitution the development of thrush is a most unfavorable symptom, running a very stubborn course or indicating the hopelessness of the case.

Diagnosis.—The white pellicle of thrush closely resembles flakes of coagulated milk and in the beginning is often mistaken for such; but the difficulty with which these spots can be removed and the associated stomatitis readily differentiates it from the latter condition. Thrush has been mistaken for diphtheritic deposit; but here the age of the patient, together with the associated conditions, the absence of foul breath, glandular involvement, fever and prostration, and the superficial character of the lesions, should readily differentiate the two. Where doubt exists, the microscope will clear up the matter.

Gangrenous Stomatitis ; Noma.

A destructive inflammatory process involving usually the cheeks, and developing as a rule secondarily to one of the infections or to some exhausting disease.

Etiology.—It generally follows upon measles, scarlet fever, typhoid fever, or some form of exhausting disease, occurring most frequently between the age of three and six years and in the poorer classes. It is due to infection by streptococci, but no specific form has been isolated.

Pathology.—Beginning on the inside of the cheek or near the corner of the mouth, a small vesicle, filled with a turbid fluid, is formed. The vesicle soon breaks, and leaves a superficial ulcer with a hard, infiltrated base, which can be felt through the cheek. This breaks down and a rapidly-spreading gangrenous process develops, with no tendency to limitation. The affected parts become infiltrated and œdematous, presenting a shiny, livid appearance.

Symptomatology.—Often the first symptom noticed will be the ulcer, as the vesicle is easily overlooked. The breath is foul, prostration profound, and the temperature of the septic-fever type. The *prognosis* is unfavorable, the patient either succumbing to septicæmia or to a secondary broncho-pneumonia ; fatal hæmorrhage is rare. In the case of recovery there is usually marked deformity.

Treatment of Stomatitis.—All forms of stomatitis can, to a great measure, be prevented by a strict attention to the hygiene of the mouth, as well as careful supervision of the diet and general hygiene of the child. As to artificially-fed babies, it is important to have the nipples and bottles kept perfectly clean, the milk sterilized, and the mouth washed out after each nursing with a soft cloth and fresh water. During the course of an acute illness, especially one of the infectious fevers, it is imperative to have the mouth kept in a perfectly clean and sweet condition ; for it is in these cases that noma is liable to develop, particularly in the enfeebled and poorly nourished.

Should one of these conditions begin, a mild antiseptic wash will be sufficient to carry the case through, excepting in the gangrenous form, which is, strictly speaking, a surgical disease. For this purpose, either a 4 per cent. boric-acid solution, alcohol diluted with two parts water, or, in the ulcerative form, hydrogen dioxid, one part to four of water, will be the least harmful and most serviceable antiseptic.

The diet is important in ulcerative stomatitis. By a restriction in the use of all salty articles of food, and the free use of fruit juices and vegetable broths, these cases recover more promptly than under ordinary treatment. Owing to the painful condition of the mouth the diet will usually have to be of a liquid nature, and in older children the use of a tube or feeding-cup with a spout will be very grateful.

Borax is perhaps the most useful remedy in the aphthous and parasitic form, especially in the early stages, with heat and dryness of the mouth. Dread of downward motion in children.

Mercurius may be indicated in all forms, but pathologically it corresponds most closely to the ulcerative form; however, I have obtained the best results from *baptisia* in these cases. *Hepar* is the remedy for mercurial stomatitis. Other remedies which may prove useful are:

Arum triph.—Aphthæ; lips swollen.

Æthusa.—Thrush; vomiting of large curds.

Ars.—Thrush; exhausting diseases; prostration; dryness of mouth.

Baptisia.—Ulcerative stomatitis; great fetor of breath; offensive diarrhœa; typhoid state. Also useful in mercurial stomatitis.

Bry.—Catarrhal stomatitis; mouth is so dry the child cannot nurse without having it first moistened.

Hydrastis.—Superficial ulceration; tenacious mucus.

Natr. mur.—Gums spongy; superficial ulcers on tongue and cheeks.

Nitr. ac.—Ulcerative stomatitis; after mercury; fetid breath and acrid saliva; acrid diarrhœa.

Rhus tox.—Great restlessness; saliva bloody.

Sulphur.—Ulcerative stomatitis; gums swollen and receding; marasmus.

CHAPTER VII.

DISEASES OF THE STOMACH.

Vomiting.

VOMITING is a prominent symptom of gastric disturbances in children; but it must not be forgotten that it is often present when no pathological condition of the stomach can be demonstrated, in which case we must either look upon it as purely functional or reflex in origin.

The simplest and most frequent cause of vomiting during infancy is over-distention of the stomach by too rapid nursing, excessive feeding, or the formation of gases in the stomach.

Vomiting is quite common with children fed on cow's milk, owing to the large curds formed from the excess of proteids in the milk. For the same reason breast-fed children often have this trouble when the mother neglects to take sufficient exercise and indulges too freely in nitrogenous foods. Too frequent nursing will have a similar effect.

Stomachic digestion is very feeble during infancy, the stomach rather acting as a reservoir for the food than as a digesting organ, for which reason any abnormal condition of its contents will soon excite expulsion of the offending matter. During an acute attack of indigestion, brought on either by a deficiency of the digestive ferments and a relative excess of the rennet ferment, whereby the milk is curdled into irritating masses, or by the ingestion of some indigestible substance, such as an amylaceous food or a soured feeding mixture, the stomach immediately rebels, and vomiting is the result.

Gastritis induces severe, persistent vomiting. Intestinal obstruction is likewise accompanied by persistent vomiting. The eruption of a tooth sometimes seems to induce it. The exanthemata, especially scarlet fever, are ushered in by vomiting, as well as other acute conditions of infectious origin.

Cyclic vomiting is a neurotic condition in which violent attacks of vomiting, sometimes persisting for several days, occur at intervals of weeks or months without any apparent cause. Herter has shown that the elimination of uric acid is decreased during the attacks, which may offer an explanation for this phenomenon.

Reflex vomiting may be induced by irritation of the fauces or be of cerebral origin. Vomiting frequently follows upon a hard coughing spell; especially is this so during whooping-cough. The vomiting of cerebral origin, whether pointing to meningitis or tumor, is often projectile in character, although not necessarily so. Continuous vomiting, with absence of coated tongue and other signs of gastric disturbance, together with retracted or flabby abdominal walls, should always lead one to suspect cerebral mischief.

Acute Gastric Indigestion.

Indigestion is rarely absolute; when such is the case there is usually severe vomiting, the stomach is rid of the offending matter, and the condition is at an end. Usually there is but partial indigestion, the food remains too long in the stomach, induces pain, nausea, perhaps vomiting of but a portion of the contents, and after the lapse of several hours it enters the small intestines only to induce a continuance of trouble here.

Etiology.—An attack of indigestion during early infancy is easy to explain. The stomach has feeble digestive powers, and is very intolerant to any form of irritation. If food be taken in larger quantity or in more concentrated form than the stomach can manage, it will not be digested;

irregularity in feeding, especially too frequent feeding, is also a prolific cause of indigestion. If the food contains micro-organisms it will decompose shortly after entering the stomach, with the formation of gases, irritating acids, and in extreme cases toxines.

Saliva is not secreted in appreciable quantity during early infancy, nor is its power to convert starch into sugar developed until after the third month; for this reason amylaceous food is very prone to induce indigestion. Saccharine food, owing to its liability to fermentation, generally brings on an attack of flatulent dyspepsia when administered in excess.

In older children the same exciting causes which will hold in the case of adults are frequently found. Irregularity in eating is a most prolific cause of indigestion in children, and as they are very liable to overeat, they frequently suffer with such attacks. Chilling the stomach with ice-water and ice-cream, and indulging in indigestible substances like nuts, crabs, cheese, etc., are very liable to induce the painful form of indigestion, while fats and pastry rather induce nausea and vomiting, and candies and cakes the flatulent type.

Symptomatology.—In infants the first symptoms which attract our attention are restlessness, crying and vomiting. The vomited matter consists of curds, undigested or partially digested food, as the case may be, and is usually mixed with serous fluid and acid mucus. The acidity is mainly due to the presence of lactic acid, as free hydrochloric acid is rare during infancy.

Should the stomach not completely empty itself, severe constitutional symptoms are liable to occur from the absorption of albumoses and products of decomposition. The child develops a high fever, becomes apathetic and prostrated; the tongue is coated, the epigastrium bloated, and diarrhœa supervenes.

Older children are usually feverish, complain of headache,

nausea, and more or less gastric pain under these conditions, while the advent of free emesis is usually followed by decided relief. The food sometimes remains for hours in the stomach in a partially digested, decomposing condition.

A mild attack of indigestion may subside spontaneously after the stomach has been relieved of its contents either by vomiting or fasting; but a more pronounced attack may leave behind a condition from which it will only recover itself slowly under judicious treatment and careful supervision of the diet.

Treatment.—Prophylaxis consists in feeding the infant on a sterilized, modified milk containing the proper percentage of proteids, fat, and lactose according to the requirements and digestive ability of the case, given in the proper quantity and at regular intervals. If these conditions are carried out the infant will rarely suffer from indigestion. Full directions for carrying out this method will be found in the chapter on “Infant Feeding.”

Starchy foods should never be given to a child before the eruption of the teeth has taken place, and then only cautiously until the molars have made their appearance.

The first step to be taken in treating this condition is to cleanse the stomach of its contents. Sometimes it is but necessary to allow the infant to take several draughts of warm water, but the most satisfactory method is *lavage*.* The process should be continued until the water comes out perfectly clear, and all traces of food and mucus have been removed from the stomach. In acute conditions one washing usually suffices.

The stomach should now receive a rest of several hours and feeding be resumed cautiously, beginning with a well-diluted sterilized milk, peptonized milk, albumin-water, or one of the reliable proprietary foods made up with water. Heubner† uses a tablespoonful of rice-meal shaken up with

* See chapter on “Nursing.”

† Quoted in “Pediatrics,” vol. iii., p. 354.

cold water, and subsequently boiled with one pint of water for a quarter of an hour, sweetened with a few teaspoonfuls of milk sugar in severe cases. According to Rotch,* a modified milk containing less than 5 per cent. lactose, about 3 per cent. fat, and in extreme cases as low as .45 per cent. proteids, will have to be used until the digestive function of the stomach becomes normal. Naturally, this will not apply to many cases, and would be unnecessary starvation in most instances. Lutaud and Shorer highly recommend somatose in gastric disturbances.

In older children it is not so easy to employ lavage, and a simpler method, such as instructing them to drink warm water and then reflexly induce vomiting by irritation of the fauces, is often more satisfactory. It is seldom, however, necessary to employ any artificial means, as children proverbially vomit on the slightest provocation.

Remedies are seldom necessary in infants after the stomach has been irrigated and the diet carefully regulated. However, there are cases in which attacks of indigestion will recur despite the greatest care in these respects. Here a remedy is necessary to correct the underlying disturbance. In older children, who can relate their symptoms, we are often capable of averting an attack by an early prescription.

Abies nigra.—Sensation of a hard-boiled egg in stomach.

Æthusa.—Vomiting of large curds of milk, followed by great exhaustion.

Antimon. crud.—Tongue white, heavily coated; great nausea; results of overeating.

Arsenicum.—After chilling the stomach with ice-cream or ice-water; nausea, prostration.

Bell.—Throbbing headache; strawberry tongue.

Bry.—During summer and sultry weather; anorexia, thirst, mouth dry, distress and pain in stomach, as of a load.

* "Pediatrics," p. 845.

Ipecac.—Nausea and vomiting, tongue usually clean; stomach feels relaxed.

Nux vom.—Tongue coated at base; bitter taste; painful pressure in stomach; great desire to vomit—urges to do so; ineffectual urging to stool; headache and vertigo; quarrelsome disposition; face hot; chilly feeling.

Pulsatilla.—Tongue coated and dry; mouth feels pasty and contains whitish mucus; no thirst or appetite; water tastes bitter; nausea with faintness; languor and feverishness; diarrhœa. After rich food, pastry and cold food (*ars.*). Often relieves where arsenicum does not act.

Chronic Gastric Indigestion; Nervous Dyspepsia.

A chronic condition of disordered digestion is seldom found to exist without a definite pathological process involving the mucous membrane of the stomach, although there is sufficient clinical evidence of a purely neurotic type of indigestion. Hyperacidity and increased secretion of the gastric juice; diminished secretion of gastric juice; sensory disturbances, and insufficiency of motor power of the stomach have all been observed as purely functional phenomena, although in the majority of cases a mild grade of gastritis accompanies these conditions, for which reason differentiation between the two is often impossible, the preponderance of the symptoms of the one condition over the other deciding the diagnosis.

Etiology.—The type of indigestion above described can usually be traced to neurasthenia or anæmia in one of its forms. Hysteria or some strong reflex excitation may induce marked hyperacidity of the gastric juice. Beside these causes it can at times be traced to repeated acute attacks; the use of improper food or insufficient mastication; general malnutrition, rickets, syphilis and tuberculosis.

Symptomatology.—The motor power of the stomach is usually deficient which allows the food to remain an undue length of time in the stomach, thus favoring fermentation

and the production of gas, together with lactic, acetic, butyric and other acids. Regarding the anomalies in secretion, Leube found that there is either a diminution or excess in the acidity of the gastric juice, although dyspeptic symptoms are often encountered where the secretion is both normal in quantity and quality, and where the food could not be found remaining abnormally long in the stomach.

The subjective symptoms complained of are distress and uneasiness after eating; sometimes malaise, headache, vertigo, and restless sleep may be observed. The appetite usually becomes impaired, and the belching of gas or the eructation of food or a sour liquid is common. Intestinal indigestion is so frequently associated, and the symptoms of the one so gradually merge into those of the other, that sharp lines of distinction are impossible.

In infants there is almost always vomiting, and if the contents of the stomach be examined, tough acid mucus will be found. It is here also that flatulency is especially prominent, the intestines as well as the stomach sharing in the production of gas. These cases are usually described as colicky babies, for they rarely seem to be without pain.

Chronic Gastritis—Chronic Gastric Catarrh.

Chronic gastritis presents in its mild form many of the symptoms of simple functional indigestion, and as the latter condition is frequently accompanied by a low grade of gastritis, the two conditions are by some authors described under the same heading. There are, however, definite pathological changes which affect the mucous membrane primarily, and the muscular coats secondarily, in true cases of chronic gastritis, making it a separate clinical condition.

Etiology.—In infants the most frequent cause of chronic gastritis is improper feeding, both as to interval in time of feeding, and quantity and quality of the food. Food of an indigestible nature is often given continuously for a long

period of time (such as amylaceous preparations or milk of an abnormally high proteid percentage) or unsterilized nursing-mixtures are administered, whereby the stomach becomes irritated from the fermentation and germ propagation going on during digestion.

In older children repeated attacks of acute gastritis are liable to assume a chronic nature, but here, also, dietetic errors are the most frequent exciting cause of the disorder. It is rare, however, for a healthy child to become a victim to chronic gastritis; as a rule there is some predisposing constitutional disease. In adults, the use of liquors, strong condiments and spices, rich, indigestible food, and late suppers, together with the cares of business and the exhausting struggle for existence, often induce a gastritis of high grade in a person otherwise sound in body; but healthy children, not being subjected to this mode of living, naturally are not expected to develop the malady. Where, however, we have tuberculosis, rickets, syphilis, organic heart disease and nephritis, causes which would ordinarily remain inactive, or at the most produce simply functional disturbances, are often sufficient to bring about definite pathological changes in the organ. In valvular disease of the heart and cirrhosis of the liver the passive congestion of the stomach eventually results in gastritis.

Pathology.—The mucous membrane, especially at the pyloric end of the stomach, is of a pale gray color, covered with tenacious mucus, and may be thickened and show injected areas. Microscopically, the epithelium of the tubules are found to exhibit degenerative changes. In the submucosa round-cell infiltration is found, which may invade the glandular structure, inducing atrophy of the tubules. The stomach is usually dilated, and in extreme cases the mucous membrane is atrophied, while the submucous and muscular layer are much increased in thickness.

Symptomatology.—The cardinal symptoms are increased production of mucus, vomiting, indigestion, and

resulting malnutrition. Intestinal changes almost constantly accompany the process, especially in infants; so no sharp line can be drawn between the two affections. If the stomach be irrigated, abundant mucus can be removed.

Vomiting usually occurs some time after eating, the food being but partially digested. In older children it may occur in the morning before breakfast, as in adults, and consists of thick, glairy mucus.

The process of digestion is slow, both on account of the presence of mucus and the deficiency in hydrochloric acid, and the deficient motor power of the stomach. For this reason we will find food in the stomach four or five hours after eating. This invites fermentative changes to take place, with the formation of gases and such acids as acetic, lactic and butyric, causing eructations and heartburn. Secondly, the production of these acids gives rise to intestinal irritation, as the intestinal juices are not adequate for the neutralization of this excessive acidity, and an acid diarrhœa may result; or, if the acids be absorbed into the general system, all the evils of the acid dyscrasia will be encountered.

Parrot divides the condition above described—namely, where gastric catarrh exists together with intestinal disturbance—into three stages, giving it the name *athrepsia* in severe cases. The first stage marks the advent of the gastric catarrh, with its symptoms of vomiting, colic, flatulent distention of the abdomen and diarrhœa. Next, progressive wasting makes itself manifest, followed by the stage of exhaustion. The child becomes dull and apathetic, the cry feeble, and death ensues, usually preceded by convulsions.

Ewald* recognizes three clinical varieties of chronic gastritis, the distinction being mainly based upon the severity of the disease and the stage to which it has progressed.

* "Diseases of the Stomach."

Thus, the first variety is described as *simple chronic gastritis*, in which the fasting stomach contains a small amount of thin, yellowish mucus, the hydrochloric acid is diminished, and lactic and fatty acids are usually present.

Chronic mucous gastritis is characterized by the presence of a large amount of mucus and absence of hydrochloric acid.

Atrophy of the gastric mucous membrane is the final stage of both forms, and here there is neither mucus nor gastric juice to be found.

Other symptoms usually found in chronic gastritis are coated tongue, bad taste in the mouth, distress after eating, variable appetite, distended abdomen, constipation. The urine contains urates in excess, and often phosphates.

As atrophy of the mucous membrane sets in, a condition of true stomachic indigestion is established. Nutrition becomes much impaired and a high grade of anæmia develops, although the intestines greatly compensate for the disabled stomach in many instances.

Prognosis.—Unless associated with a serious constitutional dyscrasia or some incurable form of heart or kidney disease, chronic gastritis is curable in its early stages, and generally shows prompt improvement under the proper form of treatment. Nothing can be done for the stage of atrophy, but it is rarely met with in children, as they either recover or succumb from athrepsia before this stage is reached. In very young and delicate children the prognosis is unfavorable unless the process can be immediately checked, as they lack the vitality necessary to rally from any form of exhaustion.

Diagnosis.—From the functional form of *indigestion* chronic gastritis is readily diagnosed by examining the contents of the stomach. The presence of an abundance of mucus and undigested food four to five hours after eating and decreased hydrochloric acid secretion, together with coated tongue, morning vomiting, and the association

of some constitutional disease or heart and kidney trouble, must at once exclude nervous dyspepsia.

The different varieties of *chronic gastritis* are differentiated by chemical examination of the stomach contents, as described under the symptomatology.

Tuberculous meningitis may be suspected from the presence of vomiting and wasting; here, however, there is fever, irregular pulse, bulging of the anterior fontanelles, and, later, the nervous disturbances.

Treatment.—The treatment of chronic indigestion and chronic gastritis is practically carried out on the same lines. Prophylaxis is a most important factor. Pure air, pure water and a perfect condition of the skin are a necessity for all cases predisposed to these affections. The diet must be carefully supervised. In infants, the time for feeding and quantity for each feed must be carefully determined upon; so also the sanitary condition of the food—namely, it must be unchanged and sterile. As there is proteid indigestion in these cases, the percentage must be cut down until the digestive powers become improved.

In older children the same regularity in eating must be observed.

Sugar and starch must be indulged in sparingly, as they favor fermentation. Rich food and fried dishes are to be avoided. Early in the treatment it is often wise to restrict the diet to milk; later, soft-boiled eggs, chops, toast, succulent vegetables, fruit and some of the cereals may be added.

Lavage is especially serviceable, and as it can so readily be carried out in young children, it is one of the most important hygienic measures at our command. Indeed, many cases show immediate improvement after the first few washings, more particularly in the subacute form, and rapidly recover when the indicated remedy and the proper diet are at the same time administered.

In many instances the condition improves under constitutional treatment more promptly than by simply taking

the stomach into consideration, as it is so frequently only the outcome of a general disease.

The remedies recommended for chronic indigestion are numerous, but there are a few which have stood the test of time, and which should therefore be first considered in connection with the disease.

Pepsin, especially the saccharated preparation, is a very useful palliative.

Nux vom. is frequently indicated, especially if the patient has been dosed with harmful remedies. We must not forget, however, that strychnine is frequently employed in these cases, and here it is better to begin with *pulsatilla*, especially if there is the pasty, heavily-coated tongue; mouth dry, containing a little thick mucus; no thirst; distress or vomiting occurring an hour or more after eating; after rich foods and pastry; belching which gives relief; in younger children usually vomiting of undigested food containing mucus, and diarrhœa.

Kreosotum is useful where there is much fermentation and vomiting of thick, glairy mucus.

Carbo veg., *lycop.* and *china* are indicated especially by the presence of flatulence. *Carbo veg.* has belching of foul gas, with coated tongue and general venous stasis of the abdominal viscera; *lycop.* has flatus passed downwards, together with dark urine which stains the diapers or causes the child to cry during micturition, from its irritating quality. In *china* there is usually colic, induced by the gas; also eructations without relief; also diarrhœa, anæmia, and emaciation. Other remedies which may prove useful are:

Arg. nitr.—Flatulency and vomiting of quantities of ropy mucus, especially in the morning.

Arsen.—After chilling the stomach with ice-water or ice-cream. Morning vomiting. Relief from hot food; drinks little and often.

Bry.—Loss of appetite, coated tongue; thirst for large quantities of water at a time; constipation.

Calc. carb..—Scrofulous diathesis; desire for eggs; stools light and clay-colored.

Euonymin..—Bilious type; tongue yellow, breath offensive; slow pulse.—(HALE.)

Hepar..—Atonic dyspepsia; sour eructations; longing for spices; cannot bear anything tight about waist.

Hydrastis..—Large, flabby tongue; catarrhal symptoms predominate; obstinate constipation.

Ipecac..—After rich food and pastry; tongue usually clean; persistent vomiting.

Natr. mur..—Emaciation, especially about neck; malarial cachexia; craving for salt.

Phosphor..—Regurgitation of food; vomiting of water as soon as it becomes warm in stomach.

Sulphur..—Skin dry and harsh, old appearance of child; aversion to being washed; faintness and hunger in forenoon; bright redness of the lips; tongue furred in morning, wearing off during day; child never seems satisfied, constant craving for food; epigastrium sensitive to pressure, which causes eructations; vomiting early in the morning and at night; “psoric diathesis.”

Acute Gastritis.

Acute gastritis may present itself as a catarrhal, follicular, or pseudo-membranous inflammation of the mucous membrane of the stomach.

Etiology.—Although gastritis in one of its forms is frequently met with during an autopsy unexpectedly, we are, on the other hand, often disappointed by finding no definite lesions at all where the condition had been thought to exist during the life of the patient. Causes which seem to excite gastritis in one individual produce nothing more than functional indigestion in another case. For this reason the etiological factors for indigestion must be looked upon as capable of also producing gastritis under certain circumstances, such as malnutrition, scrofula and rickets, unsani-

tary surroundings, especially dearth of pure air and sunshine and insufficient clothing. Among other causes mentioned as producing gastritis, such indefinite terms as "improper food or feeding" and "exaggerated form of indigestion" are given; but unless there is a predisposition to catarrhal inflammations, either within the patient himself or, as above stated, resulting from unfavorable exterior influences, functional disturbance only will be the result.

Micro-organisms do not propagate in the stomach as well as in the intestinal tract, for which reason gastritis is less common than enteritis, and when present it is usually accompanied by enteritis (gastro-enteritis, summer-complaint); but it is to be remembered that the most prolific cause of gastritis in infants is the absorption of toxines, which have usually developed in the food before entering the stomach. It may just stop short of, or develop into, cholera infantum.

Any irritant may induce gastritis when taken in sufficient quantity; many drugs come under this heading. Food given too hot has induced it; also ice-cold foods and drinks.

Direct infection has occurred during diphtheria and other infectious diseases, resulting in the membranous variety.

Corrosive gastritis is usually the result of the accidental introduction of an acid or caustic into the stomach, and belongs to the domain of toxicology.

The acute infectious diseases, such as scarlatina, pneumonia, typhoid fever and septic conditions, especially when the intestinal tract is involved, are often accompanied by gastritis.

Pathology.—The *catarrhal variety* is the one most frequently met with, and presents the usual signs of catarrhal inflammations elsewhere. The mucous membrane is hyperæmic and swollen; the sub-mucosa more or less infiltrated with round cells and distended with serous exudate.

Here and there injected areas, small hæmorrhages and superficial erosions of the mucous membrane will be found. The mucous membrane is usually most markedly affected at the pyloric end and along the greater curvature. The contents of the stomach consist of undigested and partially digested food and mucus, or it may contain only thick tenaceous mucus and serous fluid, with an admixture of brownish, decolorized blood. If the stomach be distended, it usually contains offensive gas.

The *follicular variety* is rare, is usually associated with catarrhal gastritis, and has no special etiology. It is characterized by swelling of the solitary lymph follicles of the stomach with secondary softening and necrosis, resulting in small, scattered ulcers. They are seldom large enough to attract attention, and require the microscope for verification, but in some cases there is sufficient ulceration to induce hæmorrhage and other symptoms of ulcer.

The *membranous variety* of gastritis is also of rare occurrence, and is always secondary to some infectious disease. It has been observed after diphtheria, pseudo-diphtheria, scarlatina, variola, typhoid fever, pyæmia, and in conjunction with membranous colitis. The membrane is grayish-green in color, and is composed of fibrin, epithelium, bacteria and *débris*. The mucous membrane is thickened and eroded beneath the pseudo-membrane. Pieces of the membrane are at times found in the vomited matter.

Symptomatology.—When any of the pathological changes mentioned above have developed to an appreciable degree, the symptoms of an *acute febrile gastritis* are the invariable result. The *afebrile* variety of gastritis is not so severe in its course, and must be considered a very mild grade of gastritis, or in some instances a subacute form of the disease; indeed, it is often impossible to draw a sharp line of distinction between afebrile gastritis and indigestion (functional). Rotch believes that the majority of

cases of so-called gastritis catarrhalis are nothing more than functional disorders.

The early symptoms are those of acute indigestion, namely, coated tongue, nausea and vomiting, pain, prostration, feverishness. Vomiting is the most prominent symptom, and is usually stubborn.

Booker has shown that the food may lie from four to five hours in the stomach in these conditions, and for this reason the ejecta usually consist of undigested food, beside sour mucus. If the vomiting persists for a long time bile eventually appears, and fermentation, with the production of gases and consequent flatulent distention of the epigastrium, usually takes place.

Older children complain of headache, dizziness and nausea, while the infant makes its discomfort known by fretfulness, crying and great restlessness; the pulse is small and rapid, and the extremities cold. If the gastric symptoms do not disappear within two days, diarrhœa becomes inevitable.

The *febrile* variety is more characteristic in its course, and points to decided involvement of the gastric mucous membrane. It is sudden in onset, beginning with high fever (103° to 104°), vomiting and prostration. The tongue is heavily coated and may show the imprints of the teeth; the breath is offensive and vomiting persistent, even drinks being ejected as soon as they reach the stomach. In the beginning food and mucus constitute the vomited matter; later, bile may appear. The mucus is frothy and sour, often containing blood.

Epigastric tenderness is marked; the child is exceedingly restless in the beginning from the pain and thirst, later becoming prostrated; the circulation weakens, the extremities become cold, and a clammy sweat breaks out on the forehead.

Thirst is a prominent symptom, but appetite for food or tolerance for such is not to be expected.

The fever generally falls after the second day, and ranges between 100° and $101\frac{1}{2}^{\circ}$ for several days, until at the end of five days or a week it has regained the normal standard; but intestinal symptoms usually supervene in infants, and may prolong the course of the disease. Hydroa frequently develop on the lips.

In older children the temperature does not range so high, nor is there as much prostration. Libert has claimed a specific infection for these cases.

The *prognosis* is good excepting in debilitated or cachectic infants. The *membranous variety* can only be diagnosed when pieces of membrane are vomited.

Diagnosis.—From *simple indigestion* gastritis is not easily differentiated in the beginning, but the presence of abundant mucus in the vomited matter, with at times blood; the longer duration of the attack, symptoms continuing even after the stomach has been emptied and the diet regulated, beside the elevation of temperature, must lead us to suspect gastritis and exclude functional indigestion.

The *febrile* variety is most liable to be confused with a beginning *typhoid fever*; however, the absence of nose-bleed and typical step-like rise of temperature, beside the absence of typhoid roseola and enlarged spleen, and the history of some dietetic error and presence of herpes labialis, must eventually differentiate the two affections.

The *subacute* form is most readily diagnosed by removing the contents of the stomach with the lavage apparatus, three to four hours after a milk feeding. The washings will contain particles of undigested casein, abundant mucous secretion, lactic and fatty acids, but no free HCl.

Treatment.—The *non-febrile* variety is to be treated in the same manner as indigestion, employing lavage once or twice daily, especially if there is much mucus and acid fermentation, and withholding all food for a period of six to twelve hours, as the condition of the child may suggest. Feeding should be resumed cautiously, beginning with one

of the preparations recommended under acute indigestion. Remedies are more necessary here than in simple indigestion. Older children should be put to bed, and likewise fed cautiously on well-diluted milk to which lime-water or seltzer can be added, beside weak tea, beef- or mutton-broth, or one of the reliable proprietary foods. Cracked ice is most useful for the thirst and dryness of the mouth, often controlling the vomiting. If it is not effectual in this respect, hot water may be sipped.

The *febrile* form demands even a more strict mode of treatment; here food had best be withheld for twelve to twenty-four hours, and, if the child be feeble, rectal alimentation, alcohol sponge-baths and well-diluted brandy, administered internally, must be resorted to. Cracked ice, hot water or albumin-water by the teaspoonful is all that should enter the stomach until the fever abates and the retching and pain cease. Lavage is contraindicated.

Acon.—After exposure to cold; great thirst and restlessness; high fever; anguish.

Ant. crud.—Anorexia; tongue heavily coated, as if whitewashed; after Christmas and Thanksgiving dinners; overeating.

Ant. tart.—Persistent vomiting, with tendency to collapse.

Apis.—Epigastrium sensitive to touch; yellowish diarrhœa; scanty urine.

Arnica.—After overeating; belching of putrid gas, tasting like rotten eggs; head hot, extremities cold.

Arsenicum.—After ice-water, ice-cream; great thirst, taking little at a time; vomits when rising up; prostration marked; restlessness.

Bell.—Full, bounding pulse; strawberry tongue; thirsty, but drinking aggravates.

Bry.—Loss of appetite; great thirst for large quantities of water; sensation of a load in stomach.

Ferrum phos.—Inflammatory stomach-ache in children from chill, with diarrhœa.—(BOERICKE and DEWEY.)

Cham.—Vomiting of bile; cheeks flushed; fretful and irritable temperament.

GELS.—Fever, with drowsiness; soft pulse; nausea and dizziness.

IPECAC.—Constant nausea; tongue clean; after unripe fruit or sour things; also after rich food (*puls.* has coated tongue and bitter taste).

Iris.—Great burning in mouth, œsophagus and stomach; vomiting and diarrhœa, with great prostration; the vomited matter is very acid; headache over eyes.

Merc. dulcis, 2x.—“Will cure a majority of all cases in children.”—(HALE.)

NUX VOM.—Nausea, with great desire to vomit; vertigo; frontal headache; irritable disposition; bowels constipated; after the use of coffee, condiments or irritating medicine, quack nostrums, etc.

Podophyllum.—Ejected matter very sour; expulsive effort of stomach so violent that it causes the child to cry out with pain; vomiting of bile tinged with blood.

PULSAT.—Tongue coated white, or yellowish and dry; no appetite; loss of smell and taste; no desire to drink, while the mouth is dry, and contains sticky mucus; water tastes bitter; nausea several hours after eating; diarrhœa; vertigo and chilliness; after rich food, pies and pastry, or rancid butter.

Sanguinaria.—Burning in throat and stomach; sick headache; tongue and lips red and dry; nausea and vomiting.

Sepia.—Epigastrium sensitive; urine profuse and clear, later scanty, with red deposit; tongue coated, without luster; herpetic eruption on tip and along its edges; “Especially in children after taking cold when the weather changes.”—(C. G. R.)

VERATR. ALB.—Persistent vomiting; cold sweat on forehead; Hippocratic countenance; coldness of extremities; hæmatemesis; nausea, worse from rising or moving.

Gastralgia.

The purely neuralgic type of gastric pain, or gastralgia, is seldom met with in the very young, and, if so, cannot be diagnosed for obvious reasons. The dyspepsias of infants are generally associated with pain, especially when there is much flatulence, and, naturally, gastritis is accompanied by gastric pain; but in older children gastralgia without any objective disturbance can occur, as in the case of adults.

Etiology.—A neuralgia of the stomach may result from exposure to cold and wet, drinking ice-water or eating very cold food, malarial infection, and other causes liable to induce neuralgic pains elsewhere. Irritation of the terminal filaments of the pneumogastric will induce the identical condition, and so hyperacidity of the gastric juice is a frequent cause of these attacks. Certain articles of food may induce it without producing actual indigestion in some individuals, and the use of lemon-juice, vinegar and other acids often brings on severe pain. Predisposing causes are anæmia, neurasthenia, rickets and tuberculosis; in some instances fright or anger seems to have precipitated an attack.

Symptomatology.—The pains are paroxysmal, coming at intervals, between which the patient is entirely free from any discomfort. The paroxysm may have such prodromal symptoms as yawning, pressure in the stomach and coldness of the extremities, or it may come on suddenly as a violent cramp, or as a pressing, burning or gnawing pain, so violent at times as to result in collapse. A characteristic feature of the pain seems to be its radiation from the spine and tendency to reflect up into the region of the heart, often simulating angina pectoris closely.

Diagnosis.—Gastralgia is to be distinguished from several important conditions, notably *gastric ulcer*. This is rare in children; the pain is more constant; tenderness is also constantly present, and may be definitely located at

one spot, and vomiting of blood usually occurs to verify the condition.

In *indigestion* and *gastritis* there is the history of some error in diet or other cause for the trouble, together with vomiting and relief of symptoms thereby in the former, and continued fever, anorexia, vomiting of mucus and coated tongue in the latter.

Other conditions in which pain is referred to as being located in the epigastric region are *vertebral caries* in the dorsal region and *diaphragmatic pleurisy*, which must be differentiated by their own peculiar symptoms. *Gall-stone colic* should also be suspected. Here the examination of the stools, the condition of the pulse, tenderness in the gall-bladder region and the subsequent symptoms will readily exclude simple gastralgia from these cases.

Treatment.—During a paroxysm the patient is best put to bed, although, as a rule, rest is impossible from the agonizing pain. Food should be withheld, and hot fomentations applied over the epigastrium. Where this is ineffectual, an ice-bag may be tried. Hot water internally, with a little brandy or gin added, often gives material relief.

After an attack the patient's habits must be regulated and a hygienic mode of living carried out. Irregularity in eating must be corrected, also the excessive use of starchy and saccharine food. The diet should be highly nutritious and easily digested, especially in the neurotic class of patients. They should partake of milk, eggs, young meats, succulent vegetables and stewed fruit liberally, and get sufficient exercise and fresh air. Cod-liver oil may be necessary in the scrofulous or rachitic.

ARSEN.—The pains are usually of a burning character, or purely neuralgic, resulting from the abuse of cold drinks or traceable to anæmia or neurasthenia.

BELL.—Cramp-like pain extending into spine, relieved by bending backward (opposite to *colocynthis*). Face flushed; thirsty, but drinking aggravates.

Bismuth.—Intense pressure on one spot; relief from bending backward.—(BELL.)

Bryon.—Pressure in stomach as of a heavy load. Relief from rest.

Calc. hypophos.—Attacks occurring regularly, two hours after meals, relieved by taking a cup of milk or other easily-digested food.—(F. G. OEHME.)

Cham.—Tossing about in agony; unmanageable; after anger or vexation.

Colocynth.—Cutting pains concentrating in epigastrium, relieved by firm pressure and bending double (comp. *bell*).

Cupr. ars.—"If given in the early stage of the attack it will frequently abort the severe pain. Neurotic type."—(GOODNO.)

Ferrum.—Chlorotic and anæmic cases; pressure in stomach relieved by vomiting.

Ignatia.—Hungry gnawing in stomach; faintness in epigastrium. Neurasthenia.

Lycop.—Hungry feeling, but sudden repletion after eating a few mouthfuls. Lithæmia; constipation; flatulence.

Nux vom.—Clawing pain in stomach, extending into chest or downwards, producing retraction of anus; ineffectual urging to stool; the pains are relieved by rubbing the stomach, belching and vomiting; worse after eating, although there may be craving for food. Useful both during and between the attacks.

Petrol.—The pains are ameliorated by constantly eating something (*anac.*, *chelidonium*).

Malformations and Malpositions.

Atresia or stenosis of either the cardiac or pyloric end of the stomach in infancy is congenital; later in life it may develop as the result of an inflammatory process either in the stomach or adjacent viscera, or, what is more likely to be the case, after the accidental swallowing of some caustic or corrosive poison, or from a burn. In the latter in-

stances the stenosis, as a rule, involves the œsophagus and cardiac orifice of the stomach.

The congenital form terminates fatally within a few days, while the acquired form may be relieved by surgical interference. Persistent vomiting is the only positive symptom, outside of locating the obstruction by sounding.

As regards position, the stomach may assume a vertical direction, or be located in the thoracic cavity in cases of diaphragmatic hernia.

Contraction of the Stomach.

The stomach may be abnormally small from a congenital defect, or it may contract as a result of continued vomiting, insufficient feeding, or lack of use and the general atrophy accompanying marasmus. The condition can only be diagnosed by an actual measurement of the gastric contents, while the treatment must be directed to creating tolerance for a gradually increasing quantity of food, given at regular intervals.

Dilatation of the Stomach.

Dilatation of the stomach is of more frequent occurrence in children than in adults, although the causes producing this condition most commonly in adults are quite rare in children, while, on the other hand, etiological factors inoperative in the adult will often produce a marked condition of dilatation in an infant.

Etiology.—Dilatation may take place rapidly during the course of an acute gastritis or cholera infantum. It is usually, however, secondary to chronic indigestion or chronic gastritis, as a result of the long-continued distention of the stomach by the slowly-digesting food and the gases which generate in these conditions. The general muscular atony of rickets is the most operative predisposing cause, and in chronic gastritis there is a similar relaxed condition of the muscular wall of the stomach. In the latter condition there is also a certain amount of pyloric obstruction,

resulting from the thickened state of the mucous membrane and the secretion of tenacious mucus. Pyloric obstruction may result from peritoneal adhesions or pressure exerted by tumors situated in the abdominal cavity; congenital and malignant stenosis have been recorded.

Schwyzzer* reports two cases of congenital hypertrophy and stenosis of the pylorus, and quotes, from a paper by Thomson,† the latter's theory regarding the development of this condition, according to which there is primarily a nervous disturbance leading to spasm of the pylorus, resulting in hypertrophy of the muscles. He would prefer the name "congenital gastric spasm" for this condition. Hartman‡ encountered a case in which vomiting began four weeks after birth, associated with diarrhœa, followed by constipation, progressive emaciation, vomiting at times of unusually large quantities of food, and polyuria. Death occurred in the fifteenth week. The autopsy revealed a dilated stomach and complete closure of the pylorus. The clinical course of this case would indicate the correctness of Thomson's views.

The most frequent exciting cause is overfeeding and irregularity in feeding, especially when the child is brought up on foods in which bulk must make up for what is lacking in intrinsic food-value, beside the fermentation which is induced by this kind of a diet.

Symptomatology.—The stomach is usually symmetrically dilated, with a preponderance of the deformity at the cardiac end. At times the greater curvature may reach below the umbilicus, in which case the normal contour of the organ is much changed, giving it the appearance more of a bagpipe than of a stomach. These extreme cases are, however, rarely met with.

The physical signs are epigastric bulging and a tym-

* "N. Y. Medical Jour.," No. 22, 1897.

† "Scottish Med. and Surg. Jour."

‡ "North Amer. Jour. of Hom.," Jan., 1899.

panitic percussion-note, together with splashing when there is fluid in the stomach. Chronic indigestion, belching, vomiting of large quantities of partly-digested food, and often interference with the function of adjacent organs, are the accompanying symptoms.

Diagnosis.—To positively diagnose the condition, an exact outline of the organ and a determination of its capacity must be obtained. Often we are enabled to satisfactorily percuss the abdomen three to four hours after eating. If this yields unsatisfactory results, a seidlitz powder may be administered, or the stomach filled with water. The latter procedure is, however, not entirely without danger in most cases, and is not to be employed haphazard. The lower border should not extend beyond half the distance between the umbilicus and ensiform cartilage; anything below this indicates dilatation.

Extension of the tympanitic note to the left is also important, indicating dilatation of the cardiac end. The phonendoscope is often of service to determine the outline of the organ by placing its stem in the region of the fundus and observing the changes in sound occurring by stroking the finger in different directions.

Splashing can be obtained when there is gas and fluid present.

Dilatation of the colon is to be differentiated by the concave outline of the lower border of the distended area; it being convex is dilatation of the stomach. Beside, the result obtained from the administration of a seidlitz powder, together with the clinical features of the case, are to be taken into consideration. The best results are obtained when the powders are dissolved separately and thus taken, allowing the generation of the gas to take place entirely within the stomach.

Treatment.—The prominent indication for treatment is the indigestion which is present in these cases, being best overcome by a careful regulation of the diet according to

the rules laid down in the chapter on "Feeding." Lavage is also of prime importance, especially when there is gastric catarrh or vomiting. The subsidiary measures and remedies mentioned under "Chronic Indigestion" are to be consulted.

Ulcer of the Stomach.

The *round perforating* ulcer of the stomach is very rare, but it has been met with at all periods of infancy and childhood. Its anatomical characteristics are identical with the gastric ulcer of adults, although this variety of ulcer is more frequently found in the duodenum than in the stomach. Cade* reports a typical case in an infant two months old, death resulting from perforation. He was able to collect twenty cases from literature, the ages varying from several hours to thirteen years. Henoch† has repeatedly met with the condition clinically.

A second variety is the *tuberculous ulcer*, which is also rare. A third variety is *follicular ulceration*, which is most frequently found in the new-born. Rotch cites a typical case occurring in a girl one year old.‡

I have on several occasions encountered follicular ulceration in the stomach and bowels of the new-born dying either of indefinite symptoms or with those of melena.§ The mucous membrane of the stomach is found studded with numerous ulcers of circular outline and about the size of a split pea. They may coalesce and form irregular patches. In some the superficial epithelium alone is destroyed, while others extend into the submucosa, causing considerable hæmorrhage. The stomach contains a tenacious mucus which is stained blackish from the admixture of blood. The greatest number of lesions was found at the cardiac end and at the fundus of the stomach. The colon was at the

* "Rev. Mens. des Malad. de l'Enfance," February, 1898.

† "Beitrag zur Kinderheilkunde," 1861.

‡ Rotch, "Pediatrics," 1896, p. 853.

§ See "Diseases of the New-Born."

same time involved in a similar follicular inflammation with ulceration. The small intestine seems to escape, no doubt owing to its alkaline reaction. In this respect *aphthous stomatitis* seems to bear a close relationship to the above process, only developing in the mouth when the normal alkaline secretion has become diminished or vitiated through general disturbances.

Symptomatology.—Localized tenderness, gastric pain especially aggravated by eating, and the vomiting of blood, or bloody stools, are the cardinal symptoms. These are, however, not always present, and often a positive diagnosis cannot be made. Perforation may occur, resulting in collapse and peritonitis. Colgan cites a case of round perforating ulcer, the presence of which was not suspected until perforation took place.

Treatment.—If gastric ulcer be suspected, the child should be put to bed and kept on a milk diet. In case of hæmorrhage food should be withheld, ice may be given, and rectal alimentation instituted. The most important remedies from the clinical standpoint are *arsenicum*, *argentum nitricum*, *mercurius corrosivus* and *phosphorus*, although any of the remedies mentioned under acute gastritis and gastralgia may be useful.

Cancer of the Stomach.

Malignant disease of the stomach is exceedingly rare during childhood, but it has been met with occasionally. Cullingworth has reported a case of columnar epithelioma occurring in an infant five weeks old. Ashby and Wright* report the case of a boy aged eight years who died of a columnar epithelioma involving the stomach and duodenum. In this case a tumor could be felt below the edge of the liver, to the right of and on a level with the umbilicus. There was abdominal tenderness and distention, frequent attacks of colicky pains, and gradual emaciation.

* "Diseases of Children."

CHAPTER VIII.

DISEASES OF THE LIVER.

THE position and relative size of the liver varies with the age of the child; thus, in the new-born its weight is approximately 4 per cent. of the body-weight, at six months 3 per cent., and in adults 2.5 per cent. Its lower border reaches nearly to the crest of the ilium in young children, when in the upright position,* while the upper border reaches the fifth intercostal space in the mammary line, the seventh in the axillary, and the ninth posteriorly. The low position occupied by the inferior border of the liver, in comparison with adults, is not entirely due to the greater development of the organ, but must be explained by the structural peculiarities of the thorax as well; for the ribs, by their more horizontal direction, cover the liver to a less extent than the elongated thorax of the adult.†

Jaundice ; Icterus.

With the exception of the jaundice peculiar to the new-born, the symptom indicates nothing different from the conditions capable of producing it in adults. *Icterus neonatorum* is hæmatogenous in origin, and has been described in a preceding chapter. The other cases are due to an obstruction to the flow of bile from the gall-ducts, which may result from a variety of causes. Congenital stricture or the accidental entrance of a round worm into the ductus communis choledochus, the pressure of a new growth and the lodgment of gall-stones in the duct are very rare occurrences, the commonest form of jaundice being catarrhal.

* McClellan, "Keating's Encyclopædia."

† Sahli, "Topographische Percussion im Kindesalter."

Catarrhal jaundice depends upon a catarrh of the duodenum and gall-ducts, the swelling of the mucous membrane, together with the production of tenacious mucus, inducing the obstruction. It is most frequently seen after the third year of life. The accompanying symptoms are headache and lassitude, anorexia, diarrhœa, or, more commonly, constipation, the stools being light in color and very fetid; high-colored urine, due to the presence of bile-pigments, and occasionally slight fever at the commencement of the attack. A marked reduction in the pulse-rate, which is the case in adults, does not take place at this age.

Cholelithiasis.

Although cholelithiasis is exceedingly rare during childhood, we are likely to encounter it at times, and must not lose sight of this fact in the differential diagnosis of painful abdominal affections.

I had under my care recently a child four years old which undoubtedly had gone through an attack of gall-stone colic three months prior to the time I saw it; and in a three-year-old boy suffering with violent abdominal pains I was able to demonstrate minute biliary calculi passed with clay-colored stools several days after the attack. Many cases are undoubtedly overlooked, being considered a mere gastralgia or intestinal colic.

Acute Yellow Atrophy.

This is one of the rarest diseases of childhood, only about fifteen cases being on record, according to Lanz.* It must be considered in the differential diagnosis of obscure serious ailment by which the nervous system is profoundly affected. Simulating a simple catarrhal jaundice in the beginning, the symptoms gradually assume a most alarming type, delirium, uncontrollable vomiting, dilatation of the pupils, coma and convulsions developing. The

* "Wiener Klinische Wochenschr.," 1896.

urine contains bile pigments, leucin and tyrosin; in Lanz's case albumin and acetone were also present. The temperature rises with the progress of the disease and the spleen enlarges. Other symptoms which may be observed are progressively-increasing jaundice, slight œdema of the extremities, atrophy of the liver, ecchymoses and bleeding from the gums. A fatal termination usually takes place within a few weeks from the onset, or, exceptionally, within a few days.

Cirrhosis of the Liver.

Cirrhosis of the liver is much rarer during childhood than during adult life, as alcoholic excess, the chief etiological factor producing this affection, is only in exceptional cases operative at this age, the other cases being regarded as syphilitic and tuberculous, although the eruptive fevers are considered by Laure and Honorat* capable of producing interstitial changes in the hepatic glandular structure.

The hypertrophic variety is most frequently met with, especially when traceable to syphilis. Only when the interstitial changes are pronounced will symptoms referable to the liver be induced, in which case the course is the same as in adults. More commonly, however, the cirrhosis is not suspected, being either masked by the symptoms of the exciting cause (congenital syphilis, tuberculous peritonitis, etc.), or there are insufficient symptoms to give a distinct type to the disease.

Treatment.—In selecting the diet for hepatic disturbances, we must consider the digestive as well as the assimilative functions of the liver. The rôle of the biliary secretion in the digestion of fats renders it necessary to cut down the percentage of fat in the food, as intestinal indigestion or a fat diarrhœa will result from an excess of this food when the bile is deficient in amount. Carbohy-

* Holt, "Diseases of Infancy and Childhood."

drates, being stored up in the liver, must also be given sparingly. A milk formula, with a reduction in the percentages of fat and lactose, will be indicated in infants; older children may be put on the ordinary milk diet, together with fresh, succulent vegetables, light meats, and stewed fruit. Water must be administered abundantly.

Acute yellow atrophy is universally recognized as being invariably fatal, and symptomatic treatment is all that can be instituted to ameliorating conditions as they arise. *Cirrhosis* has been benefited by anti-syphilitic treatment, and the alcoholic form can be checked when taken in time.

Remedies which will be indicated by the presence of *jaundice*, and evidence of *gastro-duodenitis* or *acute intestinal catarrh*, are *berberis*, *bry.*, *calc. c.*, *cham.*, *chelid.*, *china*, *digit.*, *gels.*, *leptandra*, *merc.*, *myrica cerif.*, *nux vom.*, *podoph.*, *pulsatilla*, *sepia*, *sulph.* Of these, *bryonia*, *china*, *mercurius virus* and *nux vom.* are the most useful and most frequently indicated, mainly on their characteristic symptoms referable to the tongue, thirst, appetite, stool, etc.

The tendency to the formation of *gall-stones* is markedly influenced by *china*. For the painful symptoms, *bell.*, *bry.*, *cham.*, *nux vom.* and *calc. c.* are occasionally of great use, although hot fomentations, and in extreme cases an anodyne or anæsthetic, will become necessary.

Hepatitis or organic changes in the liver may require *acon.*, *arsen.*, *bell.*, *bry.*, *china*, *hepar*, *mercur.*, *lach.*, *nux vom.* for the acute symptoms, and *calc. carb.*, *conium*, *iod.*, *kali carb.* or *phosphorus* for the chronic pathological conditions which may be present. *Phosphorus* is homœopathic to fatty changes, and is frequently useful in fatty degeneration and cirrhosis; for the latter condition, *aurum muriaticum* is also a valuable remedy.

CHAPTER IX.

DISEASES OF THE INTESTINES.

DURING infancy the process of digestion takes place most prominently in the small intestines, as the stomach is not fully developed at this period of life, and must be considered more as a reservoir for the food than the principal organ of digestion, although pepsin, rennet ferment and free hydrochloric acid have been positively found in small quantities in the stomach of the new-born. The bulk of the work of digestion is therefore thrown upon the intestinal tract, for which reason disturbances are more frequently found here than in the stomach.

The intestinal tract is relatively larger in children than in adults, being six times the body-length in the new-born, while in the adult it is but four times.—(BENEKE.) The sigmoid flexure is notably long, constituting one-half the length of the greater bowel.

Intestinal digestion is very active in the normal infant owing to the large amount of bile secreted, which saponifies the fats and stimulates peristalsis, the presence of trypsin and pancreatin, the former peptonizing albumen and the latter emulsifying fats, and after the third month the appearance of the diastatic ferment of the pancreatic juice, which has the power of converting starch into sugar. The muscular coats of the intestines are, however, poorly developed at this period of life.

Of the highest diagnostic importance in diseases of the intestines are the *stools*. During the first three days of life the infant has four or more evacuations of meconium, a thick, tarry, greenish substance, consisting of biliary secretion, mucus, intestinal epithelium, cholestrin crystals, epi-

dermal cells, hairs and vernix caseosa, the last three ingredients being swallowed with the amniotic fluid during foetal life.

After the meconium has been passed the normal, milk-stools make their appearance. They are yellow in color, of a thick, homogeneous consistency, and acid reaction and odor. Normally there are from 3 to 4 stools in 24 hours in the early months of infancy; one to two at the end of the first year.

The first abnormal condition to be noticed in diseases of the intestinal tract is the increased number of stools. These may be as high as twenty or more a day, and the greater the number, the smaller the quantity will be, as a rule. It can be said in a general way that where we find stools of moderate frequency (6 to 8 in 24 hours), and large in amount, the small intestines are the seat of the lesion, while with the presence of a very frequent stool, and small in quantity, the large intestines, especially the lower segment, are affected.

Tenesmus always indicates involvement of the rectum, either by inflammation or a new growth; exceptionally a foreign body.

An exception to the above rule will be found in choleraic diarrhœas, where the stools are both large and frequent.

The *consistency* of the stool depends upon the amount of serum, mucus, blood, fat or other food-remnants which may be present.

Serum is the chief constituent of choleraic stools. Fat is the prominent constituent of dyspeptic stools, and as the fat particles closely resemble casein curds in appearance, they are often mistaken for the same. In fat diarrhœa it may reach as high as 50 per cent. and over.

Mucus is normally present in the stool in small quantities, intimately mixed with the other constituents. It is always increased in the beginning of intestinal inflammations, and usually present to the last in these affections. It is more

abundantly formed in the large than in the small intestines. Mucus from the small intestines is intimately mingled with the stool, and stained greenish by the bile. From the large intestine it is more abundant and not stained, and when secreted by the rectum or lower colon it is passed in jelly-like masses, frequently with bright blood.

In a similar manner the origin of blood in the stools can be determined by careful examination. Large hæmorrhages point to tuberculous ulcers, or may occur during the course of a typhoid fever. Blood from the small intestines gives the stools a dark, tarry appearance. When passed in large clots it originates in the rectum or lower colon. Small quantities of blood thoroughly mixed with the stool usually originate from capillary hæmorrhages during the congestive stage of inflammatory affections.

The *color* of diarrhœal stools is usually green, depending upon the presence of biliverdin. Often they are yellow when passed, becoming green on standing.

Dark stools are usually produced by drugs, notably iron and bismuth subnitrate. The pathological dark, tarry stools and bloody stools have been referred to.

Light stools indicate absence of bile; fat in excess renders them grayish in color.

The presence in the stool of round cells in large number and with persistent regularity is conclusive evidence of ulceration. When associated with the bacillus tuberculosis, a positive diagnosis of tuberculous ulcer may be made.

Simple Diarrhœa ; Acute Intestinal Indigestion.

Etiology.—Owing to the functional and structural peculiarity of the stomach in infancy, the main work of digestion is thrown upon the intestinal tract, and for this reason intestinal disturbances are relatively more frequent than gastric during this period. Even in the case of gastric indigestion, diarrhœa is usually a secondary manifestation, owing to the entrance of the unsuitable or excessive quantity

of food into the intestines, unless promptly vomited. Although the dyspeptic variety of diarrhœa is the most frequent form encountered, and, as has been said before, due to overfeeding or to the use of improper food, such as breast milk too rich in proteids or fat, or vitiated by maternal ill-health, and in the case of hand-fed infants the use of insufficiently-diluted cow's milk, swill milk, starchy food in early infancy, etc., there are yet other influences capable of inducing a looseness of the bowels, to which belong mechanical irritation from the ingestion of a foreign body or irritating substance, and nervous influences, such as chilling of the surface of the body, hot weather, fright, dentition and idiopathic irritability of the intestinal tract.

Predisposing factors are important; among them are previous attacks of intestinal catarrh, anæmia, chorea, malnutrition, rickets, tuberculosis and syphilis. Physiological predisposition is most active during infancy; pathological during childhood.

Symptomatology.—The cardinal symptoms are colicky pains, flatulence and dyspeptic stools. Moderate fever is usually present. The early symptoms are pain and flatulence, with an increase in the number of stools. The number is seldom greater than 5 to 6 daily, and the watery element and amount of mucus are not increased, but there is present undigested food in considerable quantity, and in the case of a milk diet this will become manifest as white flakes, consisting chiefly of fat. Curds of casein are often present, but not to the extent of the fat, and are distinguished from the latter by their tougher consistency and insolubility in alcohol and ether. At times the percentage of fat in the stools reaches as high as 50 per cent. and over, in which case it is known as *fat-diarrhœa*.—(DEMME,* BIEDERT.†)

* "Über Fettdiarrhœe der Säuglinge," 1877.

† "Über Fettdiarrhœe," 1878.

The *color* of the stool gradually changes from yellow to green. The “spinach-and-eggs” appearance is due to the intermixing of the fat flakes with the yellow and green elements of the stool. The green color is due to the formation of biliverdin, although certain French authors recognize, beside the biliary, a *bacillary green diarrhœa*, in which the color is produced by a chromogenic bacillus, and which is usually more prevalent in the later period of infancy than the former.

The duration is short and fever is slight, or altogether absent. Should the condition, however, become prolonged through neglect of proper hygienic methods and lack of medical attention, the foundation for the development of rickets is usually laid. Fat-diarrhœa in its aggravated form is often fatal, owing to its dependence upon serious pancreatic or hepatic disorder. Demme reported nine fatal cases.

Diagnosis.—The short duration, the inconsiderable fever, or absence of fever and the character of the stools differentiate simple diarrhœa from *cholera infantum* and *enterocolitis*. Neither are the watery elements increased, as in the former, nor do we find present abnormal quantities of mucus and other constituents, such as blood and round cells, frequently found in the latter. The characteristic color and the presence of undigested food-particles are the pathognomonic symptoms.

The *bacillary form* is differentiated from the biliary by adding nitric acid, which decolorizes the former and changes the latter to violet. The transition of a simple diarrhœa into an inflammatory or choleraic affection often causes it to be overlooked.

The diarrhœa ushering in some of the *acute infectious fevers* can only be differentiated by the ultimate appearance of the symptoms peculiar to the affection.

Treatment.—Based on our knowledge of the predisposing and exciting causes of simple diarrhœa, the treatment

must be mainly dietetic. Starchy foods should not be administered until the function of the salivary glands and pancreas has become well established, which is not before the sixth month, and indicated by the eruption of the teeth.

Infants whose digestive powers are naturally weak should be put on a milk-diet whose formula shall closely approximate human milk in composition; in some instances it may even be necessary to reduce one of the component parts of the formula below this percentage, as indicated by the symptoms. When the proteids are not properly digested there will be vomiting of curds and the presence of the same in the stool; the fat may also be found in the stool in excess, or produce vomiting. Flatulence points to fermentation of the sugar.

In breast-fed infants it may become necessary to analyze the mother's milk, and regulate her diet and exercise according to the indications thus furnished. Regularity in feeding must be insisted upon.

During an attack it is advisable to withhold the usual food for 12 to 24 hours, as necessary, and administer simply boiled water, albumen-water or a thin barley-water, with sterilized milk and lime-water (barley-water 3 parts, milk 1 part, lime-water 1 part).

In the diarrhœas accompanying teething, or those of a neurotic type, such remedies as *aconite*, *belladonna*, *chamomilla*, *gelsemium*, the *calcareas* and *pulsatilla* are the ones usually indicated. In fat-diarrhœa *pulsatilla*, *hepar* and *magnesia carb.* have proven most useful in my hands.

Acon.—In the beginning; after exposure to cold or during hot weather; thirst, fever and restlessness.

Ars.—After ice-water, ice-cream, etc.; usually with neuralgic pains in abdomen.

Aloes.—Flatulence and rumbling; large quantities of gas escape with stool.

Bell.—During hot weather and dentition; face flushed, abdomen distended, colicky pains; cerebral symptoms; skin more moist, and child less restless than in *acon*.

Bry.—Sudden changes in the weather, especially when there are hot days and cold nights. Diarrhœa worse mornings, painful, aggravation from motion.

Calc. carb.—Dentition; vomiting and diarrhœa. Stools grayish, chalky, offensive, undigested; worse in afternoon and evening.

Calc. phos.—Dentition delayed; recurring attacks; stools green, with flatus.

Cham.—Dentition; painful, excoriating diarrhœa, looking like spinach and eggs.

China.—Undigested stools; flatulent colic, or painless stool with much fermentation. Anæmia and prostration.

Colocynth.—Pain relieved by firm pressure.

Cupr. ars.—Diarrhœa, with abdominal pains and vomiting. Also when there are no special symptoms for any other remedy.—(GOODNO.)

Dulcamara.—During cold, damp weather.

Gels.—Diarrhœa from fright, in older children of nervous temperament.

Ipecac.—From unripe fruit, sweets, sour or fat articles of food; vomiting, with coldness of extremities and pale face, even convulsions; stools green as grass.

Hepar.—Stools white and fetid, or clay-colored (*fat-diarrhœa*); generally sour odor both of stool and child. Worse after eating and drinking cold water; sour eructations; hepatic derangements. After mercury or cod-liver oil.

Mag. carb.—Stools green and frothy, like frog-pond scum, containing tallow-like lumps. Sour odor; colic relieved by stool; *fat-diarrhœa* and *lienteria* of sucklings.

Podophyllum.—Diarrhœa of changeable character, especially as regards color. Usually thin and painless. Prolapsus ani.

Pulsat.—Thirstlessness, tongue dry and coated; chilliness; diarrhœa worse at night, with distention of epigastrium and belching; after ice-cream, fruit and pastry; *fat-diarrhœa* (to be followed by *hepar*).

Rheum.—Dentition; sour stool and sour perspiration. Colicky pain comes on when the child is uncovered.

Sulphur.—Excoriating diarrhœa, worse in early morning. Tendency to marasmus.

Verat. alb.—Seldom indicated in non-inflammatory diarrhœa, but may become necessary from persistent intolerance to food and drink.

Acute Infectious Diarrhœa.

There are two distinct types of infectious diarrhœa, namely, cholera infantum and entero-colitis. Occurring, as they do, almost exclusively during the heated term of the year, the popular appellation “summer-complaint” has long held a prominent position in the nomenclature of these affections.

Cholera Infantum.

Cholera infantum is a high-grade gastro-enteric infection, designated *acute milk-infection* by Vaughan, in contradistinction to the less acute course assumed by cases of entero-colitis, to which he has given the name *subacute milk-infection*.

Etiology.—Although no doubt can exist as to the infectious nature of cholera infantum, attempts to isolate any specific forms of micro-organisms in these cases have so far been unsuccessful. The symptoms are due to the absorption of toxines which have developed either in the milk before administration or in the intestinal tract.

Cholera infantum is most prevalent during June, July and August, especially July, when it occurs epidemically in large cities.

Predisposing causes are hot weather, also hot, vitiated room-air and flatulent dyspepsia (Henoch*), and age. Regarding the latter, the greatest predisposition seems to exist during the second six months of infancy, at which time, also, dentition plays a prominent rôle. Vaughan† is of the

* “Vorlesungen über Kinderkrankh.,” Berlin, 1897.

† “American Text-Book of Diseases of Children.”

opinion that no predisposing causes in the child are necessary, as the healthiest may suddenly be stricken with the most violent symptoms, an introduction of the poison into the system being all that is required.

Pathology.—Post-mortem appearances will depend upon the duration of the disease. In rapidly fatal cases an abnormal paleness of the mucous membrane of the stomach and intestines, with slight swelling of Peyer's patches and the solitary follicles, is all that can be noticed. Microscopical examination may reveal epithelial desquamation and round-cell infiltration of the submucous coat, or there may be only a cloudiness of the epithelial cells. If the condition has existed long enough for secondary changes to occur, areas of catarrhal inflammation will be encountered.

Symptomatology.—Cholera infantum may begin as an attack of acute gastro-intestinal indigestion, or, what is more frequently the case, suddenly, with severe vomiting and copious dejections, high fever and rapid prostration. The temperature may be high from the beginning (104° F. and over), or it may be but slightly elevated during the entire attack. The food is promptly vomited, and later not even water or other bland substances are retained, or the vomiting may be inconsiderable as compared with the diarrhœa. The dejections are yellowish-brown or green and fecal in the beginning, and usually painless, rapidly becoming more and more watery, until at last they consist entirely of serum. They are copious, and occur from 10 to 15 times in 24 hours.

Collapse is the result of the total depletion of the system, together with the primary intoxication. With the collapse the **hydrocephaloid** state of Marshall Hall sets in, due to the cerebral anæmia, with resulting venous hyperæmia and œdema of the pia mater. The child becomes somnolent and apathetic, the pulse thready or imperceptible, while the extremities become cold and cyanotic; the eyes are half closed, sunken, and surrounded by dark rings; the cornea

is lustreless and covered with shreds of mucus; the pupils fail to react to light, the child falls into a stupor, and death supervenes, sometimes preceded by retraction of the head and convulsions.

The urine is scanty, frequently contains albumin, and may become entirely suppressed.

Owing to the great loss of fluid the child suffers intensely from thirst, and toward the end of the disease *sclerema* may develop. This is a hardening of the skin, which begins in the feet and extends to the gluteal region, sometimes also involving the back and upper extremities, due to resorption of the fluids and fat from the skin and subcutaneous tissue, with some evidence of thickening of the tissues.

In severe cases a fatal issue ensues in the course of a few days. Where the heart's action is good, the vomiting and purging gradually subsiding and the hydrocephaloid symptoms absent, a favorable termination can be looked for.

Diagnosis.—The condition with which cholera infantum is most likely to be confused is entero-colitis. From this it must be differentiated by the rapid development of the symptoms, both the primary manifestations and those developing secondarily, *i.e.*, the collapse, scanty urine, and hydrocephaloid. The serous character of the stools is another strong diagnostic point.

During epidemics of *cholera Asiatica* bacteriological examination of the stools would be the only positive test to differentiate the two conditions.

Acute Entero-Colitis ; Acute Intestinal Catarrh.

The term entero-colitis is usually adopted to designate the acute intestinal catarrhs of children, as in these cases the ileum and upper colon are more prominently affected than the other portions of the intestines. Cases in which the colon and rectum are principally involved are described as *dysenteric diarrhœa*, from the distinct clinical picture they present; and in the same way, if the catarrhal condition is

limited to the duodenum, in which case the stomach is usually also involved, the term *gastro duodenitis* is used. Etiologically speaking, the entero-colitis of infants can well be named *subacute milk-infection*.—(VAUGHAN.)

Etiology.—Causes capable of inducing indigestion are equally capable of inducing an enteritis in many cases, especially if the cause is allowed to act over a prolonged period of time. Infection with unsterilized milk, particularly during the summer months, is the most frequent cause of this affection. The micro-organisms inducing cholera infantum are either different from those of entero-colitis or their products are present in smaller quantities, not sufficient to bring on choleraic symptoms, but they eventually lead to inflammatory changes from their persistent irritative influence. Thus a cholera infantum may gradually subside into an entero-colitis, or, *vice versa*, an entero-colitis suddenly assume the choleraic type of diarrhœa.

Mechanical irritation is also capable of producing catarrhal inflammation of the gut, as well as unripe fruit and various indigestible foods.

Infants are very prone to develop diarrhœa when taken from the breast, in which case a *diarrhœa ex ablactatione* is spoken of.

Pathology.—In entero-colitis we find the mucous membrane of the ilium and colon congested and swollen, and covered with tenacious mucus. The solitary follicles and Peyer's patches are swollen, and in many instances ulcerated.

In the dysenteric cases the colon is most prominently affected, often presenting patches of croupous or diphtheritic inflammation and areas of ulceration. The rectum is also much inflamed in these cases, follicular ulceration and swelling of its mucous coat being present.

Symptomatology.—The clinical picture will vary with the seat of the affection. In *entero-colitis* the stools will be

large in quantity, containing an abundance of serum and mucus intimately mixed with the other constituents, and passed about six to eight times daily. Owing to a liberal formation of gas in the bowels and the thin character of the stools, they are forcibly expelled with a spluttering sound.

Gastro-duodenitis rarely occurs during infancy, seldom produces marked diarrhœa, and is always associated with gastric symptoms and jaundice.

Catarrh of the *large intestine* is characterized by frequent but small stools (10 to 20 daily), which contain mucus in excess of the other constituents. This mucus is white or greenish, and usually mixed with bright blood; pus is also present later in the disease. The stools are voided with much straining, which continues even after the evacuation (tenesmus), owing to the irritable condition of the rectum.

The condition usually begins with symptoms of intestinal indigestion; the child becomes restless, passes offensive flatus, and has an increase in the number of stools, which in the beginning show simply undigested food-particles. Gradually the watery element of the stool is increased, mucus is found in abundance, intimately admixed with the other constituents if originating in the small intestines, and the stools become more profuse and offensive. In the dysenteric variety the stools are smaller in quantity and more frequent than in the former, as already stated, and there is more fever and prostration.

The abdomen is usually distended unless the stools are very frequent in number, and when the descending colon is much involved, localized tenderness can be elicited along its course.

Pain is more likely to be present than in cholera infantum, and may be quite severe in dysentery.

The anus and buttocks often become excoriated from the acrid character of the stools.

Choleraic symptoms may develop during the course of an

entero-colitis, just as an entero-colitis may be engrafted upon a protracted case of cholera infantum.

A mild case of entero-colitis usually runs its course in from one to two weeks, while more serious cases may last a month, or gradually assume a chronic course, if they do not result fatally. In these cases the *prognosis* will depend much upon the child's constitution and the season of the year, being naturally most unfavorable during the hot summer months. A protracted recovery usually points to ulceration.

The dysenteric form is more serious, as can be judged from the grave lesions found post-mortem. Here the temperature is our safest guide in judging of the severity of the attack. The course is longer than an entero-colitis, convalescence usually requiring several weeks. In both forms age is an important prognostic factor; the younger the child, the graver the prognosis.

Diagnosis.—The duration of the disease, the fever and character of the stools readily differentiate intestinal catarrh from diarrhœa. From *cholera infantum* it is distinguished by the absence of serous discharges and persistent vomiting and collapse, although choleraic symptoms may appear and again disappear during the course of an entero-colitis. The seat of lesion is recognized by the character of the stool, and its quantity and frequency, as pointed out under the symptomatology.

Treatment.—Although the treatment of the infectious diarrhœas must have much in common with the entire group, yet the individual varieties will require their own peculiar remedies and adjuvants. Prophylaxis is of the greatest importance, and is equally urgent for all cases. In the first place, the exciting cause (micro-organisms) must be most rigorously combated; in no case should a child be fed on unsterilized food, or allowed to nurse from bottles or nipples not scrupulously clean.

All discharges should be disinfected, as not infrequently

diarrhœas will become epidemic in a family or hospital ward. The importance of proper ventilation of the nursery, bathing, fresh air and exercise, and the danger of weaning the child during the hot summer months, must also be borne in mind.

The diet must be carefully regulated in all cases.

In *cholera infantum* it is often advisable to withhold all food in the beginning, especially when vomiting is a marked symptom, and only allow ice or water—cautiously beginning with albumen-water, to which a little sherry or brandy may be added, then milk well diluted with barley-water, in the proportion of one to four, and if this be tolerated, the proportion of milk may be gradually increased. The above mixture is usually retained best when given cold, in teaspoonful doses. Port wine or dilute brandy is often retained when other fluids are promptly vomited, and are very useful when signs of collapse become evident.

To avert this contingency, hot baths or packs, subcutaneous injections of a normal saline solution and stimulation are often successful, whereby the circulation is sustained until the poison is eliminated and the system given time to react. One to two ounces of the .06 per cent. saline solution can readily be injected into the subcutaneous areolar tissue of the abdomen or groin, which is often followed by decided improvement in the cardiac energy.

Irrigation of the bowels is unnecessary in these cases, but lavage is of the greatest value in overcoming obstinate vomiting.

What has been said above relative to diet applies precisely in *entero-colitis* and *dysentery*, but as the process is not so severe as in *cholera infantum*, treatment is not necessarily so energetic. The child may be put on barley-water and milk, rice-water or rice-paste and milk, or a modified milk determined by a knowledge of the child's digestive powers—all, of course, being conscientiously sterilized. Sometimes it is wise to stop milk entirely for a few days

and give, instead, one of the cereal-waters, mutton-broth or albumen-water. During convalescence or in protracted cases great benefit will be derived from allowing the child to chew on a broiled lamb-chop.—(C. G. R.) As the stools are not as copious nor as fluid as in cholera, the use of intestinal irrigation is of decided benefit; once daily is quite sufficient. It is contraindicated when the rectum is much involved. Sponge-baths are useful for the febrile symptoms.

Naturally the remedies useful in diarrhœas in general are the ones most frequently indicated in all varieties, although careful differentiation is of the greatest importance, and careless or routine prescribing gives but negative or indifferent results.

Arsenicum, *ipêcac* and *veratrum album* are the most useful remedies in cholera infantum. For collapse, camphor in drop-doses of the tincture is most efficient. Goodno* cites a remarkable result obtained from the use of *zincum* 6x trit. in a case of collapse with abolition of all reflex excitability, together with a cessation of vomiting and diarrhœa.

Acon.—In the beginning; high fever and restlessness; green mucus in stools.

Æthusa.—Vomiting of large curds, followed by prostration; projectile vomiting; convulsions.

Antimon. crud.—Tongue heavily coated white; disposition much changed, making the child disagreeable and fretful.

Apis.—Cerebral symptoms; suppression of urine; coma, with hot head, dry skin; shrill cry.

Arsen.—Watery stools, with vomiting and collapse; stools offensive, first greenish, later becoming dark or brownish, acrid; also small mucus stools with tenesmus. Mainly differentiated from *veratrum album* by concomitant symptoms.

* "Practice of Medicine."

The arsenicum condition is either intense from the beginning, or, if less acute, is marked by a progressive downward course.

Bell.—Green stools, abdomen distended and sensitive; face red, high fever.

Bry.—Brought on by change of weather; stools brownish, worse from motion; great thirst for large quantities of water.

Calc. carb.—Stools light in color, sour odor; sour vomiting; dentition; rachitic tendency; belly large.

Calc. phos.—Child looks old, under-developed; stools greenish and thin; history of tardy dentition; belly flabby.

Carbolic ac.—When the vomiting is a distressing feature, two to three drops in half a glass of water, half teaspoonful every half hour.—(CHAS. D. CRANK.)

Camphor.—Sudden appearance of choleraic symptoms; great prostration and collapse; body cold, apathetic state, will not remain covered.

Cham.—Stools green, with white particles, looking like “spinach and chopped eggs;” fretful; one cheek red, the other cold; child wants to be carried about.

China.—Undigested stools; much distention of abdomen and colicky pains.

Colocynth.—Painful cases; pressure gives relief.

Cupr. ars.—Painful cases; choleraic and convulsive symptoms predominate.

Ferrum phos.—High fever, moaning and rolling of head; stools green and watery.

Ignatia.—Prolapsus ani; cerebral symptoms developing suddenly.

Ipecac.—Nausea and vomiting; stools green as grass, or like yeast. Early stages of cholera infantum.

Iris.—This remedy has yielded excellent results in cholera infantum, but is also useful for other diarrhœas accompanied by vomiting. The vomited matter is sour, the dejections are thin and tinged with bile.

Lach.—Stools dark and very fetid, or containing pus. (Compare *Kreosotum* and *Psorinum*.)

Mag. Carb..—Sour diarrhœa and vomiting; stools green, like frog-pond scum.

Mercurius.—A predominance of mucus and involvement of the rectum calls for mercury. The *bichloride* is often preferable to the metal in dysentery; *calomel* has grass-green stools. The “never-get-done” feeling of *merc. sol.* is very characteristic, while the bichloride has tenesmus of the bladder as well as rectum.

Podophyllum.—Painless, yellowish or greenish, water diarrhœa; prolapsus ani.

Sulphur.—Excoriating stools, worse mornings; marasmatic cases.

Veratr. alb..—Vomiting and purging, the latter most prominent; motion aggravates all symptoms; cold sweat on forehead. There is less prostration and thirst than under *arsenicum*, less restlessness and usually more pain, and when any doubt exists as to a choice between the two, veratrum should receive the preference, especially early in the case. When arsenicum becomes indicated the patient has passed into a state of profound exhaustion, from which it is difficult to recall him.

Compare also *arg. nitr.*, *baptisia*, *benz. ac.*, *borax*, *coffea*, *cuprum*, *dulc.*, *helleb.*, *kreosot.*, *lyc.*, *natr. mur.*, *phos.*, *psorinum*, *rheum*, *sepia*, *sil.*, *zincum*.

Dysentery.—*ALOES*, *apis*, *ARS.*, *baptisia*, *bell.*, *CANTHARIS*, *capsic.*, *colch.*, *coloc.*, *hamam.*, *IPECAC*, *kali bichr.*, *lach.*, *MERC.*, *MERC. CORR.*, *nitr. ac.*, *nux vom.*, *plumb.*, *RHUS TOX.*, *sulph.*

Hydrocephaloid.—*Æthusa*, *APIS*, *ARS.*, *bell.*, *borax*, *bry.*, *catc. phos.*, *CAMPH.*, *china*, *CUPR.*, *HELLEB.*, *ignatia*, *lach.*, *phos.*, *sul.*, *veratr. alb.*, *ZINC*.

Chronic Diarrhœa; Chronic Intestinal Catarrh. Intestinal Tuberculosis.

Chronic intestinal catarrh may result from an acute attack, or it may be the outcome of a constitutional dyscrasia, such as scrofula, rickets, tuberculosis, anæmia, etc. Some of the infectious fevers are very prone to be followed by a

more or less chronic diarrhœa, notably measles and whooping-cough, especially the latter, after which the so-called *mucous disease* frequently sets in.

Pathology.—The pathological process is not confined to any particular locality in the intestinal tract, and may affect both the large and small intestines with equal severity. The mucous membrane presents a grayish appearance, with areas of injection. The solitary follicles are enlarged, and usually ulcerated. Mucus is present in abundance, and infiltration of the submucosa with leucocytes, together with dilatation of the capillaries and compression of the glands of Lieberkuhn, are determined microscopically. The glands gradually atrophy, and in the late stages the mucous membrane presents a wasted appearance.

In *intestinal tuberculosis* the small intestine is most frequently the seat of lesion. Numerous ulcers are generally found in these cases, with the following characteristics: they are irregular in outline, the borders are overhanging and infiltrated, and they spread in a circular manner within the gut, so that their long diameter is found at right angles to the long axis of the intestinal tract. Secondary invasion of the mesenteric glands and peritoneum is seldom absent.

Symptoms.—Frequent, foul, loose bowel movements, together with progressive emaciation, anæmia, later œdema of the extremities, or general anasarca and death, are the result of severe intestinal catarrh, with atrophic changes. In tuberculous ulceration hæmorrhages are likely to occur, and the stools contain tubercle bacilli and round cells.

In milder cases the symptoms are not so persistent, and will depend upon the location of the process. The distinction is not so marked here as in acute diarrhœas, but we can often decide whether the small or large intestine is most prominently affected; especially is this the case in the so-called *chronic dysentery*.

In older children there is, beside the diarrhœa, distention

of the abdomen, coated tongue, offensive breath, dark rings under the eyes, gritting of the teeth at night, and many other symptoms suggestive of "worms." Often constipation alternates with diarrhœa.

A chronic diarrhœa during infancy is frequently the forerunner of rickets; in older children it predisposes to tuberculosis.

Diagnosis.—The diagnosis of a chronic diarrhœa becomes self-evident, but the differentiation of a tuberculosis of the intestines from simple catarrh is often impossible without a microscopical examination of the stool. The discovery of tuberculous disease in the lungs or elsewhere, together with the presence of enlarged mesenteric glands or chronic peritonitis and hæmorrhages, are strong evidence of tuberculous ulceration of the gut.

In simple catarrh we should determine whether it be primary or secondary to some constitutional or organic disease, such as rickets, malaria, nephritis.

Treatment.—The diet should consist largely of milk, which may be given pure or modified, according to the age of the child. Meat should be avoided. Plenty of fresh air or a trip to the country are of decided benefit. Irrigation of the bowels may be employed when the stools are very offensive.

Children that are rapidly losing weight and strength may receive small quantities of Burgundy wine or dilute brandy daily, and should also have oil inunctions.

In intestinal tuberculosis irrigation is contraindicated, and cod-liver oil may be added to the dietary if it does not disagree with the case.

Arg. nitr.—Stools worse at night, or immediately after eating; craving for sweets.

Ars.—Worse at midnight; stools brownish, very offensive, excoriating; senile expression.

Ars. iod.—A series of cases of tuberculosis of the abdomen, in which diarrhœa was a prominent symptom, and

in which iodide of arsenic was given with decided benefit, has recently been reported by Day.* I have occasionally employed it with good results, but must give *iodoform* the preference.

Calc. c.—Stools light or sour; scrofulous diathesis; pot-belly; sweating about head; mesenteric glands enlarged.

Calc. phos.—Abdomen flabby; stools greenish; dark-complexioned, puny, undeveloped children.

China.—Diarrhœa, with much flatulence; anæmia, prostration.

Graph.—Abundant whitish mucus in stools.

Hepar.—Scrofulous subjects; skin eruptions, acid dyspepsia, craving for sour things; fat-diarrhœa. After mercurial abuse.

Iodoform.—With this remedy I have been most successful in cases of chronic diarrhœa, especially where tuberculosis of the intestines was suspected from the great emaciation, distention of the abdomen, enlargement of the mesenteric glands and decided tuberculous diathesis. Even after the *iodide of arsenic* and other carefully-selected remedies had made no impression upon the case, *iodoform* speedily improved the condition in every respect. I usually begin with the 3x trit., and, if this aggravates, the 6x or 12x trit. are employed.

Ipecac.—Clean tongue, nausea, constant pain in umbilical region, malarial type.—(W. L. DODGE.)

Lach.—Stools very offensive; croupous enteritis; great sensitiveness in ilio-cæcal region.

Kreosotum.—Stools grayish, very offensive; child belches a great deal when carried about; old-looking children.

Merc.—Stool contains mucus in abundance, is excoriating, greenish, and voided with much straining.

Natr. mur.—Greenish or bloody diarrhœa, worse during day. Emaciation of neck most marked.

* "Tuberculosis of the Abdomen in Children," Monthly Hom. Review, No. 10, 1897 (London).

Phos.—Painless watery diarrhœa. The anus is relaxed and open.

Phos. ac.—Painless yellowish diarrhœa, with great rumbling in the intestines.

Sulphur.—Worse early in the morning; variable in color, excoriating; prolapsus ani; child is greedy; mouth and lips dry and very red; old expression; the skin is dry or eczematous in various localities; aversion to being washed.

Compare also *bapt.*, *bry.*, *carb. veg.*, *coccul.*, *croton tigl.*, *gambogia*, *nitr. ac.*, *œnoth.*, *petrol.*, *psorinum*, *sepia*, *thuja* and *silicea*.

Constipation.

Constipation is quite a common disease during infancy, and is especially liable to result from the use of an unsuitable food and the neglect of certain hygienic measures. In regard to the former, insufficient fat and excess of proteids or starchy food, or the exclusive use of boiled milk, is the usual error, and irregularity in feeding, insufficient exercise, bathing, and fresh air, furnish the latter causes. Owing to the great length of the intestinal tract and the exaggerated curve of the sigmoid flexure,* together with the feeble muscular coats of the gut, fecal residue in either insufficient or excessive amounts is usually expelled with difficulty or retained until its moisture is absorbed; congenital dilatation and hypertrophy of the colon† has also been found, together with obstinate and fatal constipation, not to mention *atresia ani* and congenital stenosis of the bowel.

Physiological disturbances, inducing constipation, are insufficient biliary and intestinal secretion.

Later in life we encounter constipation depending in the same way upon errors in diet, irregularity in attending to the calls of nature, insufficient fresh air and sunshine, and intestinal indigestion, but we must be wide awake to the fact

* Jacobi, "N. Y. Medical Record," May, 1894.

† Hensch, "Vorlesungen über Kinderkrankheiten."

that frequently it is but a symptom of some constitutional ailment of far greater importance than the mere constipation, namely, rickets, tuberculous meningitis, anæmia, and various organic disturbances.

Painful local affections often lead to constipation through a dread of evacuating the bowels.

Symptoms.—As constipation is but a symptom in itself we must search for the cause, remedy that, if possible, and apply the accessory measures toward the relief of the intestinal torpor. Although the stool is usually hard, dry, lighter in color than normal, and passed in small pieces, this is not invariably the case, for frequently the stool is soft, papescent, and of the proper quantity and color, the rectum seemingly being unable to expel it.

Treatment.—Infants fed on artificial food should have the percentage of fat increased or a predigested carbohydrate added to the milk, such as Liebig's Food or Mellin's Food. Breast-fed infants often receive much benefit from an occasional desertspoonful of olive oil.

In the case of older children the same measures hold good, but as their diet is more varied and more easily regulated, dietetic treatment is more satisfactory here. A little honey and bread at breakfast, together with oatmeal, graham wafers and some fruit, and at the subsequent meals the addition of stewed fruits, green vegetables, and the avoidance of meat and starchy foods in excess, yield most satisfactory results. At the same time the child must be encouraged in the free use of water between meals, and regular habits at stool.

Enemata are of decided benefit in habitual constipation, and are quite necessary to soften the stool where anal fissures exist.

Massage is also a most valuable adjuvant to the therapeutics of constipation, and is more applicable to infants than older children. (See chapter on "Nursing.")

The most useful and most frequently indicated remedies

for the uncomplicated cases are *alumina*, *bryonia*, *nux vom.* and *sulphur*.

Alumina.—The stool is soft and papescent; child makes no effort to move its bowels, and if so, they are usually unsuccessful; stool sticks to the anus like putty.

Bry.—Stools large and dry, as if burnt. “Constipation after castor oil.”

Graph.—Stool consists of small balls bound together by mucus; fissura ani; eczema ani; fat babies with skin eruptions.

Lycop.—Flatulent distention of abdomen; red sediment in urine; child cries when attempting to pass the stool owing to painful contraction of the sphincter.

Nux vom.—The child strains and grunts, but passes little or no stool; the abdomen is distended, herniæ are apt to protrude from the constant straining and kicking. *Nux* will often prevent this complication if given in time.

Plumbum.—“This remedy is suited to infantile constipation where the moisture of the stool has been absorbed and it is hard and lumpy, causing fissures, and is voided with difficulty, requiring severe straining.”—(FISCHER.*)

Sulphur.—Constant urging with prolapsus ani or hæmorrhoids, which bleed profusely at times. Habitual constipation; infantile atrophy and malnutrition; anus very sore after stool; intestinal indigestion, lips red, tongue dry and papillæ prominent through a dirty coating; hunger between meals; urine offensive with greasy pellicle; dry, unhealthy skin.

Beside these remedies, one of the following may suggest itself from its prominent objective local and general symptoms.

Ammon. mur.—Hard, crumbling stool, followed by a soft stool, covered with a glairy mucus.

Calc. c.—Stools large, light; oozing of offensive fluid from anus. Rickets.

* “Diseases of Children.”

Caust.—Much urging and straining at stool, with redness of face and anxiety; passed best in the standing position.

Chelid.—Stool like sheep's dung; liver sensitive.

China —Light stools; difficult, even when soft (*alumina*).

Conium.—Dizziness during stool, followed by great weakness.

Ferrum.—Anæmia; flushing of face.

Hepar.

Hydrastis.—"After purgative medicines."—(GOODNO.)

Iodum.

Kali carb.—Stool too large to be expelled; proctalgia.

Lach.—Inveterate constipation; spasm of sphincter; stool very offensive.

Natr. mur.—Stools hard and dry, producing fissures of anus.

Nitr. ac.—Stool hard and scanty; fissures with splinter-like pains.

Opium.—Obstinate constipation; stool consists of small, hard, black balls.

Phos.—Stool long and narrow.

Sepia.—Great urging, but only wind is passed. Sensation of a ball in rectum.

Study also *sil.*, *veratr. alb.*, and *zinc*.

Acute Intestinal Obstruction.

Obstruction of the bowels may result from a variety of causes, the most frequent being *intussusception* and *appendicitis*.

A twisting of the gut, known as *volvulus*, is occasionally met with in children, who at the same time present adhesions or bands of inflammatory tissues remaining after an attack of peritonitis, or in whom a congenital slit in the mesentery is found, such a case being cited by Henoeh.* *Incarcerated hernia* is rare during childhood, but has been

* "Vorlesungen über Kinderkrankheiten," Berlin, 1897.

observed. *Foreign bodies* or masses of ascarides are also the cause of the obstruction at times.

Intussusception and appendicitis are surgical diseases, but as the medical practitioner is the first to see these cases and diagnose them, little will be said regarding their pathology and surgical treatment, the differential diagnosis, prognosis and general management being to him the vital questions.

Intussusception.—Intussusception is most frequently seen in children during the first year, and has been found to occur oftener in boys than in girls. Although diarrhœa with constant straining has at times seemed to be the exciting cause, it has occurred just as well during torpid conditions of the bowel.

Intussusception consists of the invagination of one portion of the intestine into another, most frequently the lower end of the ilium, together with the cæcum into the colon. The invaginated portion may be felt in the rectum at times, and produce a marked sausage-shaped tumefaction in the region of the cæcum or transverse colon, often advancing over into the left iliac region.

Neither of these signs, however, may be discernible, particularly the tumor, which cannot be felt after the abdomen becomes much distended.

The onset is usually sudden, the first symptoms being colicky pains, with vomiting and straining at stool. The lower bowel soon becomes emptied of its fecal contents, after which there are passages of blood and mucus. The vomiting becomes stercoraceous unless the obstruction is relieved, and the patient dies in collapse.

Spontaneous reduction or sloughing away of the invaginated portion of the gut, and successful union with restoration of the lumen of the canal may occur in exceptional instances. Such a case has been recently reported by Steinmeyer.*

* "Münch. Med. Wochenschrift," vol. xliii., 1896.

The *prognosis* is grave unless the intussusception can be reduced within a reasonable time of its occurrence. Gibson* estimates the mortality as 53 per cent. from a collection of 239 cases.

Diagnosis.—Symptoms of obstruction, together with the presence of the tumor in the abdominal cavity and in the rectum, bloody stools and active movements of the intestinal coils above the seat of obstruction are positive evidences of intussusception.

Appendicitis.—Appendicitis is seldom seen as early as intussusception, only exceptionally occurring during infancy, and rarely before the fourth year. The causes are the same as in adults.

The catarrhal variety is characterized by its mild course and absence of complications.

The perforative variety may, from the beginning, be accompanied by localized plastic or suppurative peritonitis, or without any warning an apparently mild case may suddenly perforate and set up a general septic peritonitis.

The clinical features of appendicitis are very characteristic, and cannot be more tersely or more clearly described than the following paragraph from Van Lennep's† monograph indicates :

“There is the history of improper eating, or perhaps exposure to cold, associated with the menstrual period in the female; occasionally overexertion, particularly in the sedentary, or possibly a direct traumatism. Then, what have been aptly termed the cardinal symptoms: (1) *Pain*, at first peri-umbilical or diffuse, but soon referred to the right iliac fossa, unless the appendix points elsewhere. (2) *Tenderness*, almost always present at the junction of the organ with the cæcum (McBurney's point); sometimes associated with other sore spots corresponding with distal lesions or

* “Mortality and Treatment of Acute Intussusception,” N. Y. Med. Record, July 17, 1897.

† “Appendicitis.” Trans. of the American Institute of Hom., 1897.

their products. (3) *Muscular rigidity*, to corroborate tenderness, which may vary from a local or general board-like stiffness to an indistinct, circumscribed muscular tension, or a barely appreciable difference between the two recti at their costal margin. Beside this three-legged stool, as Hering would have termed these cardinal symptoms, are the well-known initial concomitants: sudden onset, the coated, flabby and indented tongue; the vomiting, which, when present, is from an overloaded or rebellious stomach; constipation, sometimes preceded by an irritative diarrhœa; distention, usually local in the early ‘tympanitic tumor,’ due to atony of the cæcum from an irritated appendix; and, lastly, as might be expected, a moderate temperature rise and pulse acceleration.”

Diagnosis.—With the presence of the above symptoms the diagnosis of appendicitis is not difficult. From intussusception it is differentiated by the absence of projectile or stercoraceous vomition, bloody stools and intestinal tumor; here also there are active movements of the intestines, while in appendicitis “actively-moving intestinal coils are not seen or felt, and gurgling is scanty or absent.”*

Treatment.—Although every case of intussusception and appendicitis is by no means a surgical one, and careful prescribing together with the proper management of the case yield the best results in many instances, especially so in non-perforative appendicitis and reducible cases of intussusception, yet the physician must be constantly on the alert and learn to recognize indications calling for operation.

Regarding appendicitis, Van Lennep† says: “My working-plan regarding operation is about as follows: In a severe attack, characterized by sudden onset, and particularly by intense cardinal symptoms, with or without corresponding concomitants, operation should be undertaken at once. In a milder seizure, the more common form, recov-

* Van Lennep, *loco. cit.*

† *Loco. cit.*

ery may be looked for, with the hope of an interval operation. In deciding the question of persistence in such cases I have come to rely more than ever on the twenty-four hour limit, and I believe that whenever doubt or would-be conservatism has induced me to delay, I have had cause to regret the inaction." Benign cases will show signs of improvement within twenty-four hours, while unfavorable cases, requiring operation, usually grow worse during this time, and become dangerous from the possibility of perforation with septic infection of the peritoneal cavity.

In the case of intussusception reduction should be attempted as soon as possible by means of taxis and inflation of the bowels with fluids or air. This is unsafe after the third day, by which time firm adhesions will have formed. The child is best anæsthetized, a soft-rubber catheter introduced into the rectum, and by means of a fountain syringe, held at a height of three feet above the child's buttocks, from a pint to a quart of a warm normal saline solution may be allowed to run in gradually, while the patient is inverted and the abdomen manipulated to aid in the reduction. Hensch recommends the use of ice-water. The operation is not without danger, rupture of the bowel having occurred where the height of the fluid was four and one half feet;* here, however, the injection was used after the third day.

Failing in this, laparotomy is the last resort, and the earlier performed, the greater the chances for recovery.

For the relief of the troublesome vomiting, lavage of the stomach is highly recommended by many writers.

Early in the attack such remedies as *bell.*, *nux vom.*, *colocynthis*, *mag. phos.*, *cupr.* and *gelsem.* may be of decided benefit. "If tenesmus is exceedingly severe, tending to increase the invagination, *aloes* or *mercurius corrosivus* may be necessary."†

* Harrington, "Boston Med. and Surg. Jour.," v., cxiii.

† Fischer, "Diseases of Children."

In appendicitis an opening of the bowels must be obtained as soon as possible by the judicious use of enemata. A liquid diet is also imperative, and for the relief of pain hot fomentations are most effectual. The ice-bag is recommended by Goodno.*

Bell.—Intense pain and sensitiveness in the right ileo-cæcal region, cannot bear the weight of the bedclothes or to be touched. There is high fever, flushed face, vomiting, patient lying motionless on back with right leg drawn up.

Dioscorea.—Severe pain in abdomen, beginning in region of umbilicus and extending to right iliac fossa, which becomes sensitive to pressure. The pain is constant, twisting in character, and becomes worse in paroxysms; constipation and thirst.

Lach.—Abdomen distended and sensitive, especially in right ileo-cæcal region; fever, prostration, scanty urine, worse in afternoon and after sleep.

Merc. sol.—Painful tumefaction in right ileo-cæcal region; tongue broad and flabby, showing imprints of teeth; constipation; fever, worse during night, with sweat, which gives no relief.

Rhus tox.—Hard, painful swelling in right side of abdomen; patient lies on back with legs drawn up; great restlessness, but cannot lie on either side; tongue dry and red, with triangular tip; typhoid state.

When suppuration is suspected *hepar* will be indicated. Other remedies which have proven useful are *arsenicum*, *bryonia*, *ginseng*, *lycop.*, *plumbum*, *sulphur*, *silicea*, *veratr.*

Intestinal Parasites.

The parasites infesting the intestinal tract of children, which are of practical importance from the clinical standpoint in this country, are two round worms, the *oxyuris vermicularis* and *ascaris lumbricoides*, and two tape-worms, *tænia saginata* and *tænia solium*.

* "Practice of Medicine."

Regarding the disturbances produced by the presence of these parasites nothing definite can be said, as it cannot be determined positively that a child has worms until they are discovered in the stools, or a microscopical examination of the fæces reveals the eggs of whichever species may be present. Fortunately they are rare, and the symptoms attributed to worms are in the vast majority of cases dependent upon some other disturbance of the general health, commonly chronic intestinal catarrh or rickets, and at other times even more serious organic disease, which is often overlooked from the convenience of classing all children's complaints under the heading of "teething" and "worms."

In the case of the *oxyuris vermicularis*, pruritus ani at bedtime, recurring regularly each night, in some cases even violent pains in the rectum; enuresis, and in male children erections with consequent masturbation, are frequent symptoms. These worms also migrate into the vagina in female children, inducing leucorrhœa and masturbation. They are found in the fæces, and can be detected at night emerging from the anus.

The *ascaris lumbricoides* is to be suspected when there are attacks of colicky pains; intestinal catarrh with loose stools or mucus in the fæces; nausea and vomiting not due to disordered stomach; irregular appetite; pale countenance with dark circles under the eyes; dilated pupils; itching of the nose; gritting of the teeth; restless sleep with starting, and atypical febrile disturbances. All of these symptoms may, however, be traceable to other conditions; and here, again, the worm or its eggs must be discovered and other diseases excluded before a positive opinion can be given. We meet with children who have repeatedly passed ascarides and yet present none of the above symptoms, while others have all of the symptoms but no worms.

Tape-worms are the least common variety in children, but cases are occasionally seen. They are usually unsuspected until segments of the worm are passed, although tape-worms may produce marked anæmia in the young.

Morphology.—The *oxyuris vermicularis*, also known as the thread-worm and seat-worm, is a small, whitish, thread-like worm, attaining a length of 10 m.m. in the case of the female, the male being 4 m.m. The female has an acuminate tail, while the male is blunt. They infest the lower ileum and upper colon, often in great numbers. The females prefer the cæcum and the colon, according to Zenker and Heller,* and, when mature and egg-bearing, migrate into the colon and rectum to deposit their eggs, whence they also creep out of the anus at night. The eggs are oval, flat on one side and rounded on the other, and exceedingly small. Before they can develop they must first enter the stomach of some host, and it is quite likely that a child often reinfects itself by swallowing the eggs from his own parasites.

Ascaris lumbricoides.—This is the common round worm, being cylindrical in shape, with tapering extremities and light reddish-brown in color. The female may attain a length of fifteen inches; the male eight to ten inches. The eggs are larger than the oxyuris egg, and possess a double shell, the contents being dark and granular. They measure about $\frac{1}{340}$ inch in length. The mature female sheds enormous numbers of these ova—according to Eschricht and Leuckart, 160,000 daily. The life-history of the ascarides is not fully understood. They infest mainly the small intestines, although they may be found at any point in the alimentary tract, sometimes even being vomited, and in rare instances inducing death by creeping into the ductus communis choledochus or into the larynx.

Tenia saginata.—This form of tape-worm is derived from beef, and is perhaps the most commonly met with variety in this country. It has a square head, with four suckers, but no hooks. It may attain a great length, and the segments are very numerous, and longer than broad. The

* Zeigler, "Text-Book of Pathological Anatomy."

life history of the worm is as follows: After the eggs are discharged into the intestinal tract by the mature segments, they reach the alimentary tract of oxen grazing on pastures where these infected stools have been passed. Here the embryos are liberated and find their way into the muscular tissue throughout the body, and sometimes into various organs, where they become converted into the cysticercus, or larval form. If this cysticercus is eaten with raw or insufficiently-cooked meat, the capsule is destroyed by the digestive juices and the contained scolex liberated, which attaches itself to the mucous membrane of the small intestine, where it soon develops into the fully-matured form by segmentation.

Tænia solium, also known as the armed tape-worm, is derived from pork, and differs from *t. saginata* in being equipped with a set of hooks beside two pairs of suckers. This parasite is also much smaller than the other variety and less frequently encountered.

Treatment.—In the case of oxyurides nothing seems to give more desirable results than the daily use of warm salt-water enemata. They must be given as high as possible, for these worms are not confined to the rectum alone, as has been pointed out. Owing to the possibility of reinfection, scrupulous cleanliness of the child must be observed. Lard may be applied to the anus at night to relieve the itching. For internal administration *teucrium* is best adapted, although *cina* or *sulphur* may be more prominently called for in some cases. “The nightly restlessness and intolerable itching which they produce as long as they exist are almost always relieved by *acon.*”—(C. G. R.)

Ascarides are usually promptly expelled by the administration of *santonin*. This is best given in the first decimal trituration, a three- to five-grain powder, according to the age of the child, night and morning, followed, on the morning of the fifth day, by a gentle laxative, if necessary. Often these parasites are expelled unexpectedly after the

exhibition of the indicated remedy, which seems to corroborate the belief that a suitable soil must exist in the host, without which the worm cannot thrive. We also know that a child often presents worm symptoms in the absence of worms, and the classical anthelmintic remedies always benefit these cases. The following remedies are therefore often called for in this everyday clinical picture.

Cina.—Sickly, anæmic children, with pale face, dark rings under the eyes; irritable, cross disposition; great nervous irritability, waking from sleep in terror; variable appetite; picking at the nose; constipation and itching at anus; feverish during night; milky urine.

Spigelia.—Colicky pains in region of navel, usually worse evenings and accompanied by palpitation of the heart, twitching of the facial muscles or strabismus; anæmia, with greenish hue of the skin; intestinal catarrh.

Stannum.—Chronic indigestion, moaning during sleep, sluggish disposition; “it prefers to lie on its stomach, to relieve the abdominal suffering.”* *Stannum* is said to kill the ascarides when used in the lower triturations, after which they can be expelled by a purgative.

Sulphur.—Pale, sickly look; eyes sunken, with blue margins; canine hunger; empty, faint feeling before dinner; alternation of constipation and diarrhœa; itching about anus; emaciated, dirty-looking children, who are filthy in their habits. Beside these remedies many others may be indicated which the individuality of the case must decide.

For the expulsion of the tape-worm the *oleoresin of filix mas* is the most certain agent. A capsule containing fifteen minims is given on an empty stomach in the morning, and an hour later one to two teaspoonfuls of *laxol* may be administered. Should this not be successful, a larger dose must be used, preceded by a saline laxative, which has a tendency to remove all mucus from the intestinal tract, and thus fully expose the head of the worm to the action of the vermifuge.

* Fischer, “Diseases of Children.”

CHAPTER X.

DISEASES OF THE PERITONÆUM.

Acute Peritonitis.

ACUTE peritonitis is rare during childhood, and when occurring is most frequently seen in the new-born as a result of infection through the umbilical cord, or after the fourth year, when appendicitis begins to play a prominent rôle in the diseases of the abdomen. The other cases of peritonitis maybe classed as primary and secondary, of which the latter is by far the more common. The primary variety develops suddenly from exposure to cold or traumatism, and in some instances a primary *pneumococcus* peritonitis is found, co-existing with meningitis, pleurisy, pericarditis or lobar pneumonia, although it is quite possible that the peritoneal infection is secondary to the above affections in most instances, especially in the case of pneumonia and pleurisy.

Secondary peritonitis is more common and more easily explained, as it results from the extension of an inflammation from other parts or through infection. Under the latter heading comes peritonitis attending perforative appendicitis, perforating empyema, perforation of the intestine during typhoid fever, suppurating mesenteric glands, pyelonephritis, etc.

Pathology.—Pathologically three forms of peritonitis exist, namely, fibrinous, or plastic; sero-fibrinous, and purulent. In the first stage there is injection of the peritonæum, with dullness of its surface, due to the deposit of a fibrinous exudate on the surface and in the meshes of the membrane, together with destruction of the epithelium. This is followed by serous exudation, varying much in quantity in different cases. The fluid is turbid from the presence

of leucocytes, and contains flakes of fibrin; it may also contain red corpuscles. When the exudation is scanty, adhesion between opposing serous surfaces takes place; when profuse, it accumulates in the peritoneal cavity, seeking its most dependent portions, and lessens the liability to adhesions. In septic cases pus is formed from the beginning, while sero-fibrinous inflammations may become purulent by an increased inflammatory migration of leucocytes. *Pneumococcus peritonitis* is purulent throughout its entire course.

Symptoms.—The onset of peritonitis is usually abrupt, and, as it is such a frequent complication of other diseases, it must be looked for and guarded against in these affections. Sudden development of sharp, cutting abdominal pains, rise of temperature to 104° F. or over, rapid, thready pulse, distended, hypersensitive abdomen, vomiting, and obstruction of the bowels or diarrhœa, should lead one to strongly suspect the onset of peritonitis.

When fully developed the abdomen is distended and tympanitic, the abdominal walls are rigid, and the patient lies on his back with the legs drawn up, to relieve the tension. Respiration becomes thoracic and is rapid and shallow, the pulse is rapid and thready, the features are pinched, the lips and extremities cyanotic, and pain is usually severe. Although diarrhœa may be present, there is most commonly a constipated condition of the bowels, and in septic cases obstruction due to intestinal paralysis, indicated by vomiting; uniform distention of the abdomen, with cessation of all gurgling sounds, is the usual condition. These cases rapidly go on to fatal collapse, although early operative interference will occasionally save a life. In the very young all forms of peritonitis are fatal; in older children the non-purulent form is not so unfavorable.

Treatment.—Being a grave condition, careful nursing is as important an element in the recovery as rational treatment. Although unnecessary meddling with the patient

may hasten the disease to a fatal termination, yet much can be done by a skillful nurse to make the patient comfortable and avert unfavorable contingencies.

The pain is usually promptly subdued by the indicated remedy and hot fomentations; and, although rest is a great essential in the treatment of peritonitis, it is better to keep the bowels open than to paralyze them by the use of *opium*. Adhesions are less liable to occur, and fatal obstruction is not invited if we avoid such treatment.

If the vomiting becomes troublesome all food must be withheld, and nothing but cracked ice or seltzer allowed; champagne is very useful in such cases. Lavage also stands highly recommended for this complication.

The remedies most applicable to the early stages are *acon.*, *bell.*, and *ferrum phos.* After these will follow *bryonia*, *apis*, *canth.*, *mercurius corr.* and *rhus tox.* when exudation sets in, *sulphur* occupying a prominent position as an agent to absorb the exudate. In grave cases, or in the advent of complications, we may find it necessary to employ one of the following remedies: *arsenicum*, *camph.*, *carbo veg.*, *lachesis*, *lycop.*, *nux vom.*, *opium* and *verat. alb.*

Acon.—After exposure to cold; hot, dry skin; rapid, hard pulse, with high fever, great restlessness and anxiety. Cutting and darting pains in bowels or burning in the abdomen.

Apis.—Exudation; burning, stinging pains; scanty urine; loud, piercing shrieks and cerebral symptoms; pneumococcus peritonitis coexisting with meningitis.

Arnica.—After traumatism, in early stages.

Arsenicum.—Later stages, impending collapse. Great anguish; clammy perspiration; the patient feels cold, and complains of burning pains in abdomen; restless tossing, thirst, obstinate vomiting, distention of the abdomen and cold extremities. (The *carbo veg.* patient is passive, but otherwise very similar clinically.)

Camphor.—Collapse.

Cantharis.—Intense inflammation, pinched features, rapid feeble pulse, cutting and burning pains.—(GOODNO.)

Carbo veg.—Great distention of the abdomen, with paralysis of the bowels. Extremities cold up to knees; collapse.

Lachesis.—Great hyperæsthesia of the abdomen; complicating gangrenous inflammation of the appendix; loquacious, adynamic fever.

Merc.—When the exudate tends to become purulent, indicated by chilliness, followed by sweat; starting in sleep; cachectic expression; foul breath; emaciation; obstinate vomiting.

Nux. vom.—Threatened paralysis of the bowels; belching; constant urging to stool without relief; vesical irritation; obstinate constipation and vomiting; chilliness from uncovering; abdomen painfully distended.

Opium.—Paralysis of bowels or antiperistaltic action; incessant vomiting, distention of abdomen, somnolence and stupefaction; warm sweat.

Rhus tox.—The *rhus tox.* patient prefers to lie on his back with the legs drawn up, although the pains make him very restless. There is delirium at night, great prostration, and a brown tongue with red tip.

Sulphur.—To hasten resorption of exudate.

Veratr. alb.—Cold sweat on forehead, vomiting and purging; small rapid pulse; great thirst, but drinking aggravates; anxiety, prostration and high fever.

Chronic Peritonitis; Tuberculous Peritonitis.

Chronic peritonitis is, in the majority of cases, tuberculous in origin, and when tuberculosis must be excluded the condition can be traced back to a traumatism,* or an inflammatory condition or neoplasm of the abdominal viscera, excepting in the case of fœtal peritonitis, which is syphilitic.† These infants are mostly born dead, although they may sur-

* Henoch, "Vorlesungen über Kinderkrankheiten."

† Silbermann, "Jahrbuch für Kinderkrankheiten."

vive with permanent peritoneal damage. Tuberculous peritonitis is usually secondary to intestinal tuberculosis, infection taking place from caseating mesenteric glands; primarily it may develop as the acute miliary type. It frequently develops after weaning, especially when milk from a tuberculous cow has been fed to the child.

Symptoms.—The disease presents itself under several different types, more or less characteristic.

The *acute miliary tuberculous type* presents the symptoms of acute peritonitis and is rapidly fatal, although remissions may occur.

The *ascitic type* may be idiopathic or tuberculous. It is accompanied by an exudate of serum, or a purulent fluid in case of admixture of septic micro-organisms.

Ulceration sometimes takes place, and a fecal fistula forms in the neighborhood of the umbilicus; in the *fibro-plastic type* dense adhesions are met with.

The *course* is slow and may terminate in spontaneous recovery, especially in the fibro-plastic type, although death may result from extensive adhesions of the abdominal viscera. The other varieties frequently recover under proper treatment, but a general infection is always to be dreaded.

Diagnosis.—The presence of fluid in the abdominal cavity, well-defined nodular tumefactions due to adhesions and organized exudate, or a sense of roughness imparted to the examining hand when palpating and rubbing the surface of the peritonæum against the viscera from a thickening of its coats, are the physical signs to be relied upon. The variety must be decided by the age, diathesis, presence or absence of tuberculosis in other organs and the history of the case.

In the presence of marked ascites hepatic disease must be excluded before a diagnosis of peritonitis can be made with certainty.

Treatment.—Owing to the favorable results obtained by laparotomy, every doubtful case should receive the benefit

of an exploratory incision, which can but benefit the patient, if it will not cure. In connection with this the patient must be carefully fed, receiving highly-nutritious diet and cod-liver oil, beside remedies of known value in tuberculosis and ascites. As constitutional remedies, *arsenicum jod.*, the *calcareas*, *sulphur*, *silicea*, *mercurius*, *hepar*, *nitric acid* and *iodoform* may be called for, while the local symptoms may indicate *apis*, *arsen.*, *calc. carb.*, *carbo veg.*, *kali jod.*, *lachesis*, *lycop.*, *mercurius*, *squilla* or *sulphur*.

CHAPTER XI.

DISEASES OF THE RESPIRATORY TRACT.

Spasm of the Glottis.

SPASM of the glottis, or *laryngismus stridulus*, is a neurosis which manifests itself as a contraction of the muscles narrowing the glottis, with resulting embarrassment of breathing. This affection has received many names, and has been confused with other affections from which it is entirely distinct; thus the *asthma of Millar* must, according to his description, be classed as spasmodic croup, and the *thymic asthma of Kopp*, if indeed such an affection can be definitely established clinically, must also remain a distinct malady.

The principal *cause* is rickets, craniotabes being especially associated with the development of these symptoms.

Age and sex also play an important rôle in the etiology; the greatest number has been observed in children under one year of age, although the first dentition period may be considered as including most cases. As regards sex, males furnish fully two times as many cases as females.

Peripheral reflex irritation or fright usually acts as an exciting cause. The *attack* begins suddenly, often during the night, but not necessarily so. The child starts with great embarrassment of breathing, attempting to inspire, which is only accomplished by interrupted efforts, accompanied by a wheezing or squeaking sound. For a moment it will present the picture of one being suffocated, when suddenly the spasm gives way with a forcible expiratory effort, and an attack of crying ensues. The *prognosis* is favorable, although death has frequently occurred in children exhausted from other ailments.

Constitutional treatment must be instituted between the attacks, paying especial attention to rickets when present.

For the attacks there are several remedies highly recommended as specifics, but nevertheless it is necessary to differentiate individual cases.

Sambucus.—This remedy was first recommended by Hahnemann. According to Searle, “Burning, red, hot face, hot body, with cold hands and feet *during sleep*. On *awaking*, the face breaks out into a profuse perspiration, which extends over the body and continues, more or less, during the waking hours; then, on going to sleep again, the dry heat returns.”*

Another remedy of definite clinical value is *chlorine*, administered in the first centesimal dilution, prepared freshly from a saturated solution of the gas in water. This remedy was introduced by Dunham, who made the following distinction between it and *sambucus*—under *chlorine* there is difficulty in expiration, none in inspiration; *sambucus* has the reverse.†

Belladonna.—This is the principal remedy when its well-known cerebral and circulatory symptoms are present.

Gelsemium is highly recommended by Hale as a palliative.

Beside these may be mentioned, as other leading remedies, *aconite*, *arsenicum alb.*, *cuprum*, *ignatia*, *iodium*, *sanguinaria*. Of the last named Nichol writes: “My own experience leads me to look upon *sanguinaria* as being the Imperial Guard of all the remedies for spasm of the glottis. . . . I give it in the form of an acetous syrup.”

Acute Catarrhal Laryngitis ; Spasmodic Croup.

This form of croup, which must be distinguished from *true croup* or *pseudo-membranous laryngitis*, is a common affection of childhood, being a catarrhal inflammation of

* Nichol, “The Larynx and Trachea in Childhood.”

† *Ibid.*

the lining membrane of the larynx associated with spasmodic action of the interior laryngeal muscles, giving the disease a paroxysmal character.

The anatomical and physiological peculiarities of the larynx and nervous system of young children, namely, the relative smallness of the larynx and rima glottidis, the great vascularity of its lining mucous membrane and the heightened reflex excitability of its nerve-supply, offer a ready explanation for the frequency of this malady during childhood and the peculiar type it assumes.

Etiology.—The chief exciting causes are exposure to cold, draughts or wet weather; acute indigestion and direct irritation, as the inhalation of irritating vapors, etc. Attacks occur more frequently during the winter and early spring than in the milder and dryer season. Beside all this, however, there seems to be an individual predisposition to the disease, often hereditary, or simply a catarrhal tendency or nervous temperament. Male children are more frequently attacked than females, and the age at which it is most liable to occur is between the second and third year.

Symptomatology.—The characteristic feature of spasmodic croup is its paroxysmal nature. The child may have been apparently well during the day, but towards night a ringing, metallic cough—sometimes before retiring, at other times not until the child has been put to bed—appears to indicate the commencement of the trouble. There may be, instead, a slight hoarseness; but notwithstanding this, the child usually falls asleep, and sleeps soundly, only to suddenly awaken at midnight, or shortly before, with all the characteristic symptoms. The breathing is much oppressed, inspiration almost impossible, much prolonged, and accompanied by a harsh, rasping sound, and expiration results in a sharp, metallic, croupy cough. The child is much alarmed, exceedingly restless, and the face presents a picture of anxiety and distress. Cyanosis and recession of the

supra-clavicular and supra-sternal spaces is marked, if the attack be long-continued and severe; often the sufferer grasps at the throat in the effort to relieve the obstruction.

The attack may last from a few minutes to an hour or longer, not, however, in one continued mode of severity, in which case it would result fatally. A second milder attack is liable to occur during the same night, and on the following two or three nights it may again be looked for with all probability. A moderate amount of fever, together with some catarrhal secretion, is usually present. The condition rarely results fatally.

Diagnosis.—*Pseudo-membranous croup* is the most important condition, and often the most difficult one from which false croup is to be differentiated. In the absence of grave constitutional symptoms; *complete relief* of all symptoms between attacks, which are always *paroxysmal* and most liable to occur shortly before midnight; absence of exudation in the pharynx or upon the tonsil, and the presence of *hoarseness rather than suppression of the voice*, eliminate true croup with a fair amount of certainty. Again, auscultation of the larynx, revealing a dry, wheezing or hissing respiration and a hoarse-sounding, croupal cough, is, according to Trousseau,* not a sign of exudation in the larynx, but rather of its absence.

Laryngismus stridulus is to be differentiated from mild attacks, which can usually be readily done by a careful comparison of the two ailments.

Pseudo-membranous laryngitis, being identical in its pathology and symptomatology with laryngeal diphtheria, if not invariably so in its etiology, which rests entirely with the presence or absence of the *Klebs-Löffler bacillus* in the exudate, will, for the sake of convenience and clinical importance, be described under the subject of "Diphtheria."

Treatment.—During an attack the child should be supplied with steam inhalations as soon as possible, which may

* Nichol, "The Larynx and Trachea in Childhood."

be accomplished by simply holding a basin of steaming hot water before it, or, in case a croup-kettle is accessible, a tent should rapidly be improvised. If this does not offer sufficient relief a cold pack should be applied to the throat.

Remedies are both useful to mitigate the severity of the paroxysm and to overcome the tendency to recurrence.

Aconite, *hepar* and *spongia*, as recommended by Bœnnig-hausen, are of exceptional service when given successively, although it will be usually found that one begins in its pathogenesis where the other leaves off, and it is therefore wisest to continue the single use of each of these remedies as long as it seems indicated.

Acon.—High fever, dry skin, great restlessness, nervous temperaments; after exposure to cold winds or draughts; checked perspiration.

Bell.—Barking cough; pre-paroxysmal symptoms of attacks; child wakes suddenly; great vascular excitement; *rawness* and *pain* in larynx, with hoarseness.

Spongia.—"Its most remarkable therapeutic virtue is to cure croup. Among other symptoms, it is indicated in this disease by difficulty in breathing, as though a plug had lodged in the throat, and as though the larynx were so constricted that breath cannot pass through it."—(HÄHNEMANN.) "The sawing respiration of this remedy is also characteristic. The aggravation is in the evening; *hepar* in the morning."—(HERING.)

Hepar.—Deep, rough, barking cough; rattling of mucus in larynx and trachea; laryngeal symptoms remaining after the paroxysm.

Phosphorus.—This remedy is recommended highly by several observers, often acting curatively when the above remedies have failed to give decided relief. It is especially useful for the hoarseness and bronchitis remaining after the attack.

Ipecac and *lobelia* are extensively used by many physicians in this affection, and undoubtedly yield excellent

results, provided they happen to suit to the case. The first acts best in the fluid extract, while the second is recommended in the infusion.

Acute Bronchitis.

Acute catarrhal bronchitis is one of the common ailments of childhood, seen especially in the rachitic or those in whom malnutrition and anæmia are a prominent feature. Children who are closely confined, either in the poorer crowded quarters or in nurseries insufficiently aired and sunned, are particularly liable to bronchitis, for which reason most cases prevail during the winter months and early spring.

Secondarily, bronchitis accompanies measles, whooping-cough, influenza, typhoid fever and several others of the infectious fevers almost unfailingly; its pathology and symptomatology are the same in these cases as in the primary variety.

Primary pseudo-membranous or croupous bronchitis is a rare affection, the etiology of which is not well understood, and the diagnosis of which depends upon the expulsion and discovery of fibrinous casts of the bronchial tubes. *Secondarily*, it may result from extension of a laryngeal croup.

Pathology.—As in the case of spasmodic croup, a catarrhal inflammation of the bronchial tubes during infancy is of more serious import and accompanied by more suffocative symptoms than a similar condition in adult life. The greater vascularity and looseness of the mucous membrane, and the relatively smaller size of the air-vesicles and smaller amount of breathing-surface in the infantile respiratory tract, are the reasons for these attacks assuming so dangerous a course. Outside of its tendency to spread to and involve the finer ramifications of the bronchial tree, acute catarrhal bronchitis presents nothing apart from the same process in adults. In fatal cases the mucous mem-

brane appears swollen, injected, ecchymosed, and covered with mucus and purulent secretion. In the larger tubes the lining membrane alone is affected, while the smaller and finest ones are involved throughout their entire thickness in the inflammatory process. The lungs are usually emphysematous, from dilatation of the air-vesicles and choking up of the capillary tubes with secretion.

Symptomatology.—Bronchitis may run a mild or a dangerous course. In the first case there will be slight fever, cough, which at first is dry and irritating in character, later becoming loose and accompanied by rattling of mucus in the larger tubes. Some soreness in the region of the bifurcation of the trachea may be present, but the child evinces no great degree of pain or discomfort, and within a week or ten days the attack is over.

When the smaller tubes, however, become involved, the case presents a different aspect entirely. There is marked dyspnœa, imperfect aeration of the blood and enfeebled circulation, higher fever (103° to 104° F. or over), and the chest abounds in subcrepitant and sibilant râles, beside the rattling of mucus in the larger tubes. The child is exhausted from the incessant cough and carbonic acid poisoning, and the cough is too feeble to expel the muco-purulent secretion blocking the air-vesicles and bronchioles. It becomes dull and apathetic, even comatous, the pulse rapid and thready or imperceptible, and death, sometimes preceded by convulsions, terminates the scene.

This severe type, described as **capillary bronchitis**, is, strictly speaking, in reality a broncho-pneumonic process.

Diagnosis.—In bronchitis the percussion-note never becomes altered unless emphysema, atelectasis or other complications develop during its course. In mild cases there are at first dry râles, followed by large moist râles, with here and there a sibilant and small moist râle, all best heard posteriorly. In the second variety *subcrepitant* and

sibilant râles, general in distribution, with large moist and dry râles in the large tubes and trachea, and areas of dullness, with diminished respiratory murmur, indicating collapse of air-cells, are to be elicited. Hyper-resonance, resulting from vicarious emphysema, is difficult to recognize in children, as the normal percussion-note is in itself highly resonant.

Treatment.—In mild cases of bronchitis it is often advisable to keep the child out in the fresh air as much as possible, instead of in rigid confinement to the bed or nursery. The predisposition to bronchitis must be overcome by cold sponging, plenty of out-of-door exposure, and the correction of the underlying diathetic condition with appropriate remedies and diet, fats being especially beneficial.

Severe cases of bronchitis should receive all the care and attention accorded a case of pneumonia.

Remedies are numerous, the most useful, however, judging from the frequency of their successful employment, being *acon.*, *bell.*, *bry.*, *ippecac*, *merc.*, *puls.*, *rhus tox.*, *tartar emetic* and *sulphur*.

Beside these the *calcareas*, *cham.*, *ferrum phos.*, *hepar*, *hyos.*, *lycop.* and *phos.* are often indicated in individual cases.

In the early stages *acon.*, *bell.*, *bry.*, *cham.*, *ferrum phos.* and *mercurius* must be differentiated.

Aconite has high fever, dry skin, no chilly feelings as in *mercurius*, nor disposition to moisture of the skin, as in *belladonna*, which has a dry, distressing, paroxysmal cough, usually worse towards evening.

The greatest usefulness for *bryonia* seems to be to loosen the cough when the same shows no disposition to become so, remaining deep and hollow, apparently coming from the stomach, aggravated by motion and often accompanied by pain. *Scilla* is also strongly indicated by painful cough; it is, however, a more severe type than *bryonia*, there being

cyanosis and failing circulation, owing to extension of the process into the finer tubes.

Cham. suits mild cases of tracheo-bronchitis in the early stages; the cough is excited by attempting to use the voice, and the child is fretful and cross.

Ferrum phos.—Often preferable to *aconite* in cases characterized by marked dyspnœa right from the beginning, with rapid progress, soon assuming the capillary variety. The cough is short and dry, often paroxysmal, and when expectoration appears it is streaked with bright blood. Well suited to rachitic subjects.

Mercurius.—“*Mercurius* corresponds with the whole course of a severe attack of bronchitis, even better than *belladonna*. There is violent fever, the temperature is very high, there is a great disposition to sweat without obtaining any relief from it; in contradistinction to *belladonna* there is a constant alternation of chills and heat, with a remarkable sensitiveness to the most trifling changes of temperature.”* Tongue thickly coated yellow; diarrhœa; cough dry, worse evening until midnight; dyspnœa; expectoration tenacious.

Lobelia inflata.—“Think of lobelia in asthenic bronchitis of children with profuse secretions, and difficulty in removing the accumulations; also if there is a sense of oppression and feeling of dullness.”—(T. G. ROBERTS.†)

As the cough becomes loose, *ipêcac*, *puls.* and *tartar emet.* or one of the *calcareas* will be required. For the therapy of the severe types and complications the reader is referred to the article upon *Broncho-pneumonia*.

In *pseudo-membranous bronchitis* I have obtained excellent results from *phos.*

Chronic Bronchitis.

Chronic bronchitis may result from repeated attacks of acute bronchitis, or, what is more commonly the case,

* Bæhr, “Science of Therapeutics.”

† “Medical Advance,” July, 1898.

follow upon an attack of whooping-cough, measles, or some other acute illness, when there is a predisposition offered to the development of bronchitis by the existence of a favorable diathetic condition. In the younger cases rickets or simple malnutrition lay the foundation for chronic bronchitis, while in older children the scrofulous diathesis is usually found. As a secondary disease, it accompanies tuberculosis, organic heart disease and Bright's disease.

The important *pathological conditions* are thickening of the mucous membrane, with areas of superficial ulceration, weakening and irregular dilatation of the bronchial tubes, and more or less extensive vesicular emphysema.

The important *symptoms* are cough and expectoration, the characteristic condition being that notwithstanding the long continuance of these symptoms the general health rarely suffers to a marked degree. Naturally, these children are not up to a normal standard of health, as the etiology of the affection indicates; at the same time there is no pronounced wasting or suffering induced by the disease.

The cough is loose, usually paroxysmal, and may become dry and teasing at times. It is generally worse in the morning, and the expectoration of large quantities of offensive muco-pus on rising, associated with localized gurgling râles, is strongly indicative of bronchiectasis.

The *course* is a slow one at the best, and cases may be apparently cured in the summer only to have a relapse during the winter. Nevertheless, the *prognosis* is good, the condition being much more amenable to treatment than in adults for the reasons that the tissues are more regenerative and the disease less frequently dependent upon an incurable associated condition.

Treatment.—An equable, moderately warm and dry climate is desirable; the pine regions are especially beneficial. A non-medicinal tonic treatment must be instituted in all cases—baths, fresh air, exercise and a highly-nutritious diet being the essentials.

Hepar sulph. I have found of especial benefit for the paroxysmal cough coming on at night. A powder of the third decimal trituration will usually relieve these attacks with astonishing promptness.

Pulsatilla, of course, is indispensable for the loose cough with profuse easy expectoration of yellowish or yellowish-green muco-pus, having a tendency to become tighter and more troublesome at night. This remedy acts very satisfactorily with *hepar*, and I frequently employ it during the day, giving a dose of *hepar* at night.

Lycopodium is particularly useful for the recurrent type of bronchitis, in which the patient is seldom free from a troublesome cough, "catching cold" on the slightest provocation. "Cough dry, day and night, in feeble, emaciated boys."—(C. WESSELHOEFT.) Lithæmic subjects; acid dyspepsia; cough ending with a loud belch.

Sulphur.—Rarely will a case be found in which sulphur is not at one time or another indicated. Especially in the scrofulous or rheumatic type of constitution will it be found useful. It has not proven of much use where emphysema was present; but where there is a large amount of tenacious mucus, mixed with lumps of pus, of foul taste and odor, it seems particularly applicable. There may also be attacks of oppression of breathing, in which the patient gasps for air.

Tart. emetic.—Useful in recent cases, with loud râles in the larger tubes, and dyspnœa with the cough.

The *calcareas* are especially called for upon their diathetic indications.

Calc. carb., beside its characteristic sweat, large belly and glandular enlargements, will be indicated by loose cough, with expectoration of yellowish, sweetish mucus, or dry, teasing cough, with dyspnœa and palpitation of the heart from slightest exertion. *Calc. phos.* is more suited to the purely rachitic with diarrhœa, or cases of simple malnutrition.

Silicea.—Emaciated children, tuberculous diathesis; night-sweats; profuse purulent expectoration; skin dry and scurfy; hectic fever; bronchiectasis; lack of normal body-heat, with constant chilliness. The cough is aggravated from cold drinks, and is deep and distressing.

Beside these it may be necessary to resort to one of the following remedies for special conditions and symptoms:

Ars.—Emphysema; dyspnœa.

Carbo veg.—Hoarseness; chronic spasmodic cough remaining after whooping-cough.

Iodium.—Especially indicated in dark-complexioned, emaciated children. Ravenous appetite without a corresponding gain in weight; enlarged bronchial glands. The *iodides* are particularly useful in the bronchitis accompanying phthisis.

Kali bichr.—Tough, stringy expectoration; cough excited by eating. Bronchitis after measles.

Kali hydr.—Syphilitic cases.

Stannum.—Bronchial dilation, with excessive purulent expectoration; weak feeling in chest.

Asthma.

The majority of cases of asthma occurring during childhood are of the catarrhal type, the asthmatic paroxysm accompanying a bronchitis or broncho-pneumonia. The typical spasmodic type as seen in adults is rare, seldom occurring before the sixth year, although mild asthmatic phenomena such as *bronchial spasm*, occurring with dentition; *asthma dyspepticum*,* due to indigestion, and *hysterical asthma* (*pharyngeal spasm* and *hysterical tachypnœa*), are frequently met with prior to this time.

Idiopathic spasmodic asthma is most probably a vasomotor neurosis intimately associated with the uric-acid diathesis, although the bronchial-spasm theory has still many

* Henoch, "Berliner Klinisch. Wochenschr.," 1876.

adherents. Local irritation induced by pathological conditions of the nose and pharynx plays an important rôle as a reflex exciting cause.

Symptomatology.—The attacks occur suddenly, usually at night, the chief symptom being dyspnœa, accompanied by a dry cough and characteristic respiration. The inspiration is difficult, accompanied by recession of the soft parts of the thorax, and expiration is prolonged. The respiratory murmur is diminished, and the chest abounds in sibilant and sonorous râles; wheezing may be heard at quite a distance from the patient. Cyanosis becomes pronounced if the attack is a prolonged one. The attack may last from a few minutes to an hour or more, and generally ceases suddenly with a free secretion from the bronchial tubes; they recur at intervals of days or weeks.

The *catarrhal form* is only the engrafting of the asthmatic element upon a pre-existing bronchitis or broncho-pneumonia, in individuals thus predisposed. At times these children are subject to pseudo-croup, the asthma seemingly taking the place of the former. During its entire course they are always more or less “wheezy.”

The *diagnosis* depends upon a recognition of the nervous element in the case—the spasmodic and paroxysmal nature of these attacks, together with the characteristic physical signs of the diseases, namely, dyspnœa, cyanosis, diminished respiratory murmur, loud sibilant and sonorous râles, vesiculo-tympanitic percussion-note. When bronchitis or broncho-pneumonia coexist, their signs must be discounted.

Treatment.—The same hygienic measures recommended for bronchitis are applicable to overcome the tendency to recurring attacks of asthma. All foci of local irritation in the naso-pharynx or elsewhere should receive prompt attention. The remedies most useful to mitigate the attacks are *acon.*, *ars.*, *ipêcac* and *nux vom.*; beside these there are several others which are often prominently indicated. The interval requires constitutional treatment.

Acon. is recognized by its well-known mental condition, feverishness, etc.; neurotic cases.

Apis.—When the attacks seemingly follow the recession of an urticaria, or alternate with the same. The chest feels bruised, and the attack ends with the expectoration of a large amount of frothy mucus and serum. It is a valuable remedy for the asthma of children.

Ars.—Paroxysms between midnight and daybreak; must get out of bed; great anguish and prostration; broncho-pneumonia.

Ars. jod.—Between the attacks.—(BELLVILLE.)

Ipecac.—Wheezing; constant cough, with subcrepitant râles all over chest; no phlegm yields, although the chest seems full. Gagging and vomiting; the child stiffens during the choking attacks; cyanosis and coldness of extremities.

Lobelia.—In connection with disordered stomach; weakness in pit of stomach; attack preceded by prickling sensation in extremities; distressing tightness across upper portion of chest.

Nux vom.—Asthma dyspepticum; attacks in morning; irritability and constipation.

Pulsatilla.—Cough, becoming dry toward night, with dyspnœa; inability to lie down; chilliness; mild, tearful disposition.

Tart. emet.—Rattling of mucus in larger bronchial tubes, with wheezing, great dyspnœa, and threatened collapse. This is a most valuable remedy for the catarrhal form of asthma, when there is a large secretion of mucus, together with pronounced dyspnœa.

Acute Broncho-Pneumonia.

Broncho-pneumonia, also known as *catarrhal* and *lobular pneumonia*, is one of the most frequent diseases of childhood, presenting a mortality rate only exceeded by diarrhœal diseases, and being particularly prevalent before the

fourth year of life. As the name indicates, it is a pneumonic process associated with inflammation of the bronchial tubes, in reality an extension of the latter condition into the walls of the terminal bronchi and surrounding end alveoli.

Etiology.—A primary and a secondary broncho-pneumonia is to be distinguished. Primarily it occurs with especial predilection in those debilitated by previous illnesses, or in the rachitic and syphilitic. Atmospheric changes are the chief exciting cause, as the greater prevalence of this disease during the winter months and early spring clearly indicates. Primary broncho-pneumonia is rarely seen after the fourth year.

Secondary broncho-pneumonia accompanies and complicates the acute infectious fevers, prominently the exanthemata, diphtheria, whooping-cough and influenza, a class in which bronchitis is a frequent symptom.

The latest bacteriological researches indicate that primary broncho-pneumonia is nearly always due to the *pneumococcus*, while secondary broncho-pneumonia results from a mixed infection, in which the *streptococci* of suppuration play the most important rôle. When complicating diphtheria the *Klebs-Löffler bacillus* is the excitant of the pathological process. Pearce* found in 62 of such cases the *Klebs-Löffler bacillus* 52 times, the *streptococcus pyogenes* 27 times, the *staphylococcus pyogenes aureus* 11 times, *staphylococcus pyogenes albus* once, *pneumococcus* once. In 17 cases the *Klebs-Löffler bacillus* occurred alone; in 7 the *streptococcus pyogenes*. In other cases there was almost always a combination of these varieties, with, however, a preponderance of the cocci. In summing up, he remarks that where a local or general infection existed the pneumonia was due to the same micro-organism, but where the condition was a chronic or non-infectious process it was

* "Bacteriological Report on Acute Lobar and Acute Broncho-Pneumonia," Jour. Boston Soc. Med. Sci., June, 1897.

generally due to the pneumococcus. The investigations of Prudden and Northrup,* and those of Neuman† and others practically lead to the same conclusions.

Pathology.—The pathological processes of broncho-pneumonia are seen both in the bronchial tubes and in the pulmonary parenchyma. In the larger tubes the same changes occurring in acute bronchitis are to be found. The smaller tubes are, however, affected throughout their entire thickness in the inflammatory process, the mucous membrane alone being the seat of inflammation in the larger ones. Proliferation of epithelium, together with exudation of serum and leucocytes, takes place in the alveoli, in other words, a productive inflammation in the lobules and terminal bronchi, for which reason resolution is much more slowly accomplished than in a purely croupous pneumonia. The consolidated areas are not restricted in their location to the extension from a bronchus, being also found scattered throughout the lung, apparently without definite relation to any particular affected bronchial tube. An entire lobe may be involved to the extent of producing a complete consolidation, but careful inspection reveals separate invasions of lobules, indicated by the presence of freshly consolidated, reddish areas, together with older ones undergoing gray hepatization and resolution.

Areas of atelectasis, fibrinous exudation upon the pleura and enlarged bronchial glands, may accompany the destructive process.

Symptomatology.—A primary broncho-pneumonia begins as a bronchitis in the vast majority of cases; exceptionally the pulmonary changes develop at the same time or prior to, or even independently of, the former. Instead of progressing favorably as an uncomplicated bronchitis, there are added progressively-increasing dyspnoea and rapid breathing, increase in fever and pulse-rate, and prostration.

* "Amer. Jour. Med. Sciences," June, 1889.

† "Jahrbuch für Kinderkrank.," xxx.

As the case becomes fully developed the child emaciates markedly, and carbonization of the blood becomes apparent. The pulse is rapid and weak, and the heart may eventually fail in its work if the pulmonary obstruction be extensive.

Cough is a prominent symptom, at first being dry and later becoming loose, although this by no means indicates that the child is gaining relief, for the secretion may be beyond its control, acting as a mechanical obstruction to the air-cells.

The respiratory rhythm is changed in a characteristic manner, the recognition of which has always been to me a strong indication for pneumonia. Normally inspiration and expiration follow each other without interruption, after which comes a pause. In broncho-pneumonia inspiration is separated from the expiratory act by a well-marked pause, with no pause, however, between the expiration and inspiration. The reason for this change in rhythm is undoubtedly to bring the inspired air in contact with the pulmonary tissue as long as possible in order to overcome the carbonization of the blood; therefore the child rests rather before expiration than after it, no time being lost, thereby, to draw in a fresh supply of oxygen.

Respiration is often accompanied by fan-like movements of the *alæ nasi* and recession of the soft parts of the thorax, notably its lower portion, producing the peri-pneumonic groove of Trousseau.

When broncho-pneumonia develops during the course of one of the infectious fevers as a complication, it is to be suspected from an increase in the fever; increased rapidity of breathing and pulse-rate; cough and dyspnœa, especially the latter.

Broncho-pneumonia is slow and progressive in its development, and its course sometimes extends over several weeks. Resolution is slow and tendency to chronicity is strong, especially in the scrofulous and tuberculous.

Meningeal symptoms are of common occurrence in the disease, sometimes being toxæmic in origin, at other times resulting from an active congestion of the meninges with serous effusion into the arachnoidal spaces. Here there is always hyperpyrexia and a very rapid course, and rachitic subjects seem most prone to develop this complication.

Death results from respiratory or cardiac failure; sometimes from hyperpyrexia. Collapse is the commonest termination, although convulsions may appear to close the scene.

The *prognosis* is always unfavorable, as can be seen from the high mortality rate; it is especially so when the child is very young and debilitated, or when the disease is secondary to a condition in itself dangerous. The pulse and respiration are the main indications of the child's condition, and although a high temperature is a bad omen, it is not really to be feared unless it proves itself beyond control. When active measures fail to keep a high temperature (above 104° F.) in check it augurs a bad omen. Rickets seem especially liable to invite hyperpyrexia.

A grunting expiration is said to indicate atelectasis, but it is not necessarily a bad symptom, unless very pronounced and persistent. The cough is also a guide to prognosis; if it becomes weak and inefficient we must expect a gradual suffocation as a result, unless the exudation can be absorbed.

Children in whom the tuberculous diathesis is well marked are liable to the most serious consequences from an attack of broncho-pneumonia. An ordinary broncho-pneumonia will become tedious; the temperature remits, leading us to suspect a malarial condition or even typhoid fever, but the case continues, in spite of our best-directed efforts, toward a fatal termination.

Diagnosis.—The physical signs are those of both bronchitis of the larger and smaller tubes, together with consolidation of scattered areas of pulmonary tissue of vari-

able size and extent. They are best studied posteriorly, the child being held over the nurse's shoulder. Large and small moist râles; subcrepitant râles; tubular breathing and dullness over the consolidated areas large enough to convey these signs; diminished breathing over areas of atelectasis, and exaggerated breathing in the vicariously emphysematous lung are to be elicited. However, the irregular fever, dyspnœa, alteration in the respiratory rhythm and cough, and the detection of subcrepitant râles and areas of tubular breathing are usually quite sufficient, and often the only available signs upon which the diagnosis can be made.

From *croupous pneumonia* it is distinguished by its gradual onset, tedious course, bilateral distribution, and its occurrence in the very young and in the feeble, croupous pneumonia attacking those in apparently good health and of maturer age.

Treatment.—The child should be put to bed, and its position changed occasionally to avoid adding hypostatic congestion to the already seriously crippled condition of the lungs. Infants can be taken up by the nurse during coughing paroxysms and held face downwards or on the side to facilitate the expulsion of the phlegm. The room must be faithfully ventilated, and a temperature of about 70° F., or slightly lower, is to be maintained. Beside this, it is essential to keep the air moist in the immediate vicinity of the child, which is best accomplished by means of the croup-kettle and a tent improvised over the bed.

Ordinarily, the fever is within the control of remedies and sponge-baths; indeed, an alcohol sponge-bath (1 part alcohol to 3 parts of water) has a most decided effect upon the temperature, rapidly bringing it down to within a safe limit, at which point it is maintained for an hour or more. In fulminating cases, or such as have been mismanaged, the graduated cold, full bath will be required. This is often a life-saver, bringing the condition under the control of the foregoing measures.

Plain woollen underwear, the weight conforming to the time of year, is all that is necessary to protect the chest, which, with the rest of the body, should be regularly sponged.

Stimulants can rarely be dispensed with, and they will be called for during certain periods of all bad cases. Alcohol sponging and alcohol compresses to the epigastrium substitute more or less successfully the internal administration of brandy or whiskey in infants.

The remedies most frequently indicated in the early stages are *acon.*, *bry.*, *ferrum phos.*, *ippecac* and *scilla*; for the later manifestations, especially the unfavorable symptoms liable to arise, *tartar emetic*, *phos.*, *arsen.*, *carbo veg.* and *veratrum alb.* are called for.

Aconite should always be studied in comparison with *veratrum viride* and *ferrum phos.* All three are indicated early in the disease, when there is high fever and a teasing cough, with little or no expectoration—the stage of congestion. *Aconite* is distinguished by its great anxiety and restlessness, thirst, and aversion to being touched or moved, which induces suffering; *veratrum viride* by its high arterial tension, bloodshot eyes and cerebral irritation; *ferrum phos.* by the absence of either nervous erethism or high arterial tension and by its characteristic frothy, blood-streaked expectoration. It is particularly applicable to the rachitic diathesis.

Arsenicum is indicated by extreme prostration and restlessness; dyspnœa from the slightest exertion; thirst for small quantities of water, the mouth being dry and the tongue and lips cracked; diarrhœa; cold surface.

Bryonia is of the greatest service to loosen the cough, control pain, and check the extension of the process into the smaller tubes and absorb the exudation. It must be differentiated from *scilla*, which is very similar in many respects, but more suitable to grave cases marked by progressively-increasing prostration and dyspnœa, with rapid,

weak pulse. There is a short, painful cough, causing the child to cry faintly after each paroxysm, and it cannot be moved without the induction of pain. In my experience, the younger the child, the more efficacious has been this remedy. Hale* considers *scilla* the remedy above all others after *aconite* and *belladonna*, being in every respect homœopathic to broncho-pneumonia.

Belladonna is often called for by its cerebral symptoms, either early or during the height of a fulminating case.

Chelidonium is recommended where the right side is chiefly affected, with associated hepatic disturbances. It has the fan-like motion of the *alæ nasi* so strongly indicative of *lycopodium*.

Gelsemium.—Broncho-pneumonia complicating influenza; after sudden checking of perspiration; pain under scapulæ; drowsiness; soft, rapid pulse.

Ipecac is the remedy where the bronchial element predominates and the chest seems literally filled with mucous secretion, subcrepitant râles being heard everywhere in abundance. The cough is very troublesome and gagging, giving little relief. The secretion gradually collects to such an extent in the finer bronchi that suffocation becomes imminent. Here it differs from *tartar emetic*, which represents a state of carbonic-acid poisoning in which mucus, collecting in the larger tubes, produces the characteristic rattling, or in which there is active pulmonary œdema.

Lycopodium is one of the most useful of all remedies in broncho-pneumonia, its particular sphere being, so to speak, a "choked-up" condition of the entire respiratory tract. The nose is obstructed; the *alæ nasi* expand with each inspiration, which is often a purely sympathetic condition, not dependent upon marked dyspnœa. The cough is dry day and night, a few moist râles and some wheezing being heard over the sternum; swelling of the mucous mem-

* "Practice of Medicine."

brane of the bronchi seems to predominate over secretion. Likewise the lungs may be much involved, without, however, much cough or secretion. The child is peevish and irritable, especially on awaking from sleep; the urine is scanty and deep red, and when passed often induces crying; all symptoms are worse in the afternoon and early evening.

Phosphorus.—Where consolidation predominates over the bronchial symptoms, together with active congestion, producing a tight, distressing cough; rapid, shallow respirations; tightness across the upper portion of the chest; blood-tinged expectoration; failing right heart.

Sulphur is similar to *phosphorus* in respect to the consolidation, but it has a greater power of removing the same, phosphorus only controlling the vascular disturbance (unless pushed to produce fatty degeneration of the inflammatory products, which is not without danger). It is indicated in the later stages of broncho-pneumonia.

Tuberculin (Koch) has been highly recommended for broncho-pneumonia. Dr. Mersch* reports several cases in which relief was rapidly obtained from the sixth dilution. Dr. Arnulphy† makes strong claims for the efficacy of *tuberculin* in broncho-pneumonia, placing it above such remedies as *ippecac*, *iodine*, *tartar emetic* and *phosphorus*.

Bacillinum (Burnett) is recommended by Cartier‡ in respiratory affections characterized by *oppression* and *muco-purulent expectoration*; the dyspnœa results from pulmonary obstruction, caused by excessive secretion in the bronchi. In his opinion, these cases are non-tuberculous. He recommends the 30th potency, one dose every two to three days.

Aviaire, or *avian tuberculin*, he has found useful in broncho-pneumonia following influenza and measles, accompanied by an incessant tickling cough, with closely localized

* "Journ. Belge d'Hom.," 1894 and 1895.

† "Clinique," Feb., 1896.

‡ "The Viruses of Tuberculosis," Trans. Internat. Hom. Congr., 1896.

pulmonary symptoms and emaciation—*suspicious bronchitis*, which causes apprehension of tuberculosis. This remedy he administers in daily doses in the 100th potency.

Chronic Tuberculous Broncho-Pneumonia ; Phthisis.

The type of pulmonary tuberculosis described as phthisis, or consumption, is a tuberculous broncho-pneumonia developing primarily from infection through the respiratory tract. It runs a more or less chronic course, according to the severity of the process and the susceptibility of the patient to the *tubercle bacillus*. Tuberculosis affecting the lungs may be either primary or secondary in origin, and acute or chronic in its course; however, the condition above described is the form in which this disease is typically encountered. Infection takes place here directly through the channels of the respiratory tract, the pathological process beginning in the terminal bronchi and end alveoli; in the secondary variety miliary tubercles develop within the lung parenchyma, the germs being carried from a tuberculous focus elsewhere by embolic infection. The bronchial glands are the most frequent source from which such an infection arises.

Hereditv and the tuberculous diathesis are the predisposing causes, and some of the infectious fevers, notably measles and whooping-cough, bear a strong causative relationship to the disease.

Pathology.—The process is rarely confined to the apices, as in adults, and the bronchial glands are almost invariably involved; in fact they are often attacked first, infection travelling along the lymphatic channels, and involving the pulmonary structure in a diffuse tuberculous infiltration secondarily. This is the common form encountered during infancy, while in older children the typical primary apical consolidations, consisting of epithelial overgrowth and alveolar hyperplasia in the apices of the lungs, is seen as in adults. When the process becomes general the lungs will

be found more or less consolidated, studded with gray and yellow tubercles; large caseous masses and cavities; fibroid interstitial changes; bronchitis; pleurisy.

Symptomatology.—The symptoms of pulmonary tuberculosis are not characteristic enough in young children to definitely locate the trouble, nor are the physical signs such as will clearly indicate the nature of the lesions. Beside this, the lungs are seldom affected alone, tuberculosis co-existing in other parts, giving a mixed type to the disease. Where, however, a child presents a picture of progressive emaciation accompanied by cough, and a remitting temperature, together with a tuberculous family history or the diathesis indicating the same, tuberculosis is to be suspected, and in the absence of characteristic intestinal and nervous symptoms the disease may safely be stated to be pulmonary.

The physical signs are unsatisfactory, as a rule, but bronchitis, localized subcrepitant râles, exaggerated respiratory murmur with impaired resonance in the interscapular, apical or basal portions of the lungs, and sometimes bronchial breathing, can usually be elicited by careful examination.

In older children it follows the same course as in adults, and the symptoms and physical signs are identical. The consolidation here begins in the apex, indicated by dullness, bronchial breathing, and localized subcrepitant râles; and as the lung becomes more involved and caseation and necrosis, with cavity formation, results, the physical signs will change accordingly. Cough, anorexia, progressive emaciation, diarrhœa, night sweats and hectic fever are the accompanying symptoms. The *prognosis* in this type is much more favorable than in the infantile type; in the latter the process seldom fails to become general, the child dying of acute miliary tuberculosis or tuberculous meningitis. Again, the prognosis of phthisis in children between the ages of six and twelve is more favorable than in adults, as they respond more kindly to treatment, and have a

greater chance of outgrowing the disease under suitable climatic and hygienic surroundings.

Treatment.—Climatic and hygienic treatment are of the utmost importance.

Remedies to be of use must be such as have a decided action upon the general nutrition and are capable of controlling the catarrhal condition; notable among these will be found the *iodides*, especially *ars. jod.*, *iodoform* and *stannum jod.*; *sulphur*, *lycopodium*, and several other remedies recommended for *Chronic bronchitis*.

Baptisia is useful for the hectic fever; *silicea* a most potent remedy to check the profuse sweating. The dyspeptic symptoms, diarrhœa, hæmoptysis, etc., require special attention.

Tuberculin (KOCH) and *Bacillinum* (BURNETT) have been extensively used and looked upon with favor by many observers. Prof. Arnulphy considers tuberculinum 30x capable of stopping the progress of the disease in a large proportion of incipient cases of pulmonary tuberculosis. (See *Clinical Lecture*.*) The differentiation of the various viruses of tuberculosis is discussed above, p. 167.

The child should be fed to its utmost capacity, food being administered in small quantities and at short intervals (two to three hours), if a full meal is not well borne. Cod-liver oil or some other fat becomes indispensable, and may be used to better advantage in the form of inunctions in infants.

Croupous Pneumonia.

Croupous or *lobar pneumonia* differs from broncho-pneumonia in being a purely primary affection, one or more lobes of the lung being distinctly affected in a characteristic pathological process. The exciting cause is a specific micro-organism, the *diplococcus lanceolatus*, or *pneumococcus*.

Etiology.—Croupous pneumonia is most frequently seen after the third year, and usually attacks those of previously

* "Clinique," June, 1897.

good health, unlike broncho-pneumonia, which attacks the debilitated or develops secondarily to the infectious fevers. Exhaustion and exposure to cold act prominently as predisposing causes, and the disease is most prevalent during the colder months of the year, especially in the spring.

Infection with *Fränkel's diplococcus* accounts for the majority of cases, the *pneumobacillus* of *Friedländer* having been found the exciting cause in a minority of instances. The complications of croupous pneumonia are usually due to a spread of the infection, the *diplococcus* being found in the pleural, peritoneal and meningeal inflammatory exudates.

Pathology.—In typical cases one lobe is affected, most often one of the lower lobes. Pleurisy is commonly associated with the pulmonary inflammation, as is also bronchitis. When the left lower lobe is consolidated, pleurisy and pericarditis quite commonly develop in children.

The affected lobe at first becomes congested and œdematous. As the air-spaces become filled with fibrinous exudate, leucocytes, and red-blood corpuscles, it solidifies and assumes a red color. This is the stage of red hepatization. The lung is tough and cuts like liver, but in children the cut surface does not present the typical granular appearance seen in the adult, as the air-cells are much smaller and underdeveloped.

Eventually it assumes a grayish color, from the degeneration of the red corpuscles and their absorption, compression of the capillaries, and the presence of an abundance of leucocytes and pus corpuscles. This is the stage of gray hepatization. The exudate is now gradually removed by the lymphatics, part being also coughed up through the bronchi. This constitutes the last stage, that of resolution.

Symptomatology.—The onset of croupous pneumonia is a rapid one, and the course of the disease is characterized by its acuteness throughout; sudden onset, high temperature, with but slight remissions, termination within

from six to eight days by crisis, are the features of a typical case.

The initial symptom is usually a chill, which may be replaced by a convulsion in young children; sometimes vomiting replaces either condition. The temperature rises rapidly, soon reaching a height of 104° or over; the pulse is rapid and full, and the respirations notably increased, soon exceeding the normal ratio of pulse and respiration. Thus, with a pulse of 130 there will be 60 or more respirations, the normal ratio being one respiration to four heartbeats.

Together with the fever there is great restlessness, dry, hot skin, headache and slight delirium toward night, and a dry, painful cough. Especially when there is an associated pleurisy does this painful cough become conspicuous, the pain being very sharp and located at the seat of the inflammation. At times the pain is referred to the epigastrium, in which case it is due to irritation of the intercostal nerves, or it may indicate a complicating pericarditis.

Within from two to four days the process of consolidation is generally complete, as can be demonstrated by the dullness and bronchial breathing observed over the affected area. With the crisis, which may appear on any day from the fifth to the ninth, oftenest, however, on the seventh day, there is a marked amelioration of all symptoms. A profuse sweat accompanies this sudden fall in temperature, and at times, indeed, there occur quite alarming symptoms of collapse, calling for immediate action. After the crisis the process of resolution becomes established, being completed in from five days to a week in the average case. A rise of temperature during this time—in other words, a post-critical rise—indicates the development of some complication, such as pleurisy, empyema, meningitis, pericarditis or the extension of the pneumonic process to other portions of the lungs.

Many severe cases of pneumonia present so different a

clinical picture from the group of symptoms above described that their consideration becomes of essential importance, and according to their peculiar manifestations they have been described as distinct varieties.

Cerebral pneumonia is characterized by rapid onset, with high fever, convulsions or vomiting, together with a predominance of cerebral symptoms during the entire course of the disease. In children over two years convulsions are not so common, these cases assuming more of a typhoid state, there being stupor, delirium, dry, brown tongue, involuntary stools. Symptoms simulating meningitis, such as sopor, strabismus, opisthotonos, slow, irregular pulse, retracted abdomen, dilated pupils, convulsions, are a frequent accompaniment of pneumonia, and there seems to be a close clinical relationship between pneumonia of the upper lobes and cerebral symptoms, notwithstanding that this is disputed by some competent observers. The pneumonic process is slow to develop in many cases, and often the consolidation cannot be detected until after the fifth day of the disease; for this reason it is often confounded with meningitis. The writer recalls a case of croupous pneumonia occurring in a child five years old which was diagnosed as meningitis by a most expert clinician until, dullness and bronchial breathing being detected in the right upper lobe, together with a disappearance of all serious symptoms with the crisis on the seventh day, made it possible to recognize the true nature of the case. That these symptoms are toxic in nature there is little reason to doubt, but the possibility of a true purulent meningitis developing must never be lost sight of. This does not, however, develop during the height of the pneumonia, as a rule, and a return of fever with cerebral disturbance after the crisis is more likely to prove of serious import than the earlier manifestations.

Another form of pneumonia worthy of mention is the so-called **wandering pneumonia**, in which the pneumonic

process spreads from its original seat to other portions of the lung, resolution going on at one point while a fresh invasion attacks another.

Central pneumonia is of especial interest from the diagnostic standpoint, as in these cases the process begins in the centre of a lobe, gradually spreading to the periphery. It is a patent fact that such cases cannot be recognized until there is sufficient consolidation to produce physical signs, and they are frequently overlooked for this reason. Grave symptoms may exist with but a slight amount of consolidation, the toxæmia being entirely out of proportion to the existing lesion.

The *physical signs* will depend upon the stage at which the patient is examined; thus, in the first stage there is only a slight amount of dullness over the affected area, but the *crepitant râle*, heard at the end of inspiration, will be found as a pathognomonic sign. In the second stage the signs of consolidation become manifest; they are elicited as increased vocal fremitus; dullness on percussion; bronchial breathing and bronchophony. In the third stage the signs of consolidation gradually disappear, giving way to moist râles; bronchial breathing emerges into broncho-vesicular, and eventually the true vesicular type is re-established. During this entire stage the percussion-note is more or less impaired until the lung regains its normal state.

Diagnosis.—The affections from which croupous pneumonia is to be differentiated are *pleurisy*, *broncho-pneumonia* and *meningitis*. The essential points distinguishing it from the last-named condition have been referred to in the symptomatology; from *broncho-pneumonia* it is distinguished by its characteristic onset and course, especially the temperature-curve and the important differences mentioned under that disease. (See *Broncho-pneumonia*.)

In *pleurisy* the temperature is not so high, more remitting in character, and ends by lysis; beside this there is diminished vocal fremitus and suppressed respiratory

murmur, or only a distant and indistinct bronchial respiration. In the first stage the friction sound can be elicited.

Treatment.—The treatment of croupous pneumonia is essentially the same as that recommended for *broncho-pneumonia*. There are, however, certain remedies which are especially related to croupous exudations, in contradistinction to those of a purely catarrhal type, and they will, therefore, be more often called for here. Thus *ipécac* and *tartar emetic* are less frequently indicated than *bryonia* and *sulphur*.

Iodine is recommended by Kafka* as being truly homœopathic to the croupous exudation, as well as to most of the symptoms. The *iodide of potash* he considers more valuable in apex pneumonia, especially when there is a tuberculous tendency.

The high fever and cerebral symptoms will call for *belladonna* or *veratrum viride*.

Tartar emetic and *bryonia* hold the first place in *pleuro-pneumonia*.

Although *phosphorus* is more useful in broncho-pneumonia than in croupous pneumonia, still it is of the greatest service where there is marked congestion indicated by dyspnoea; tightness across the upper portion of the chest; bloody expectoration; failing right heart, and profound toxæmia.

Sulphur is perhaps the most useful absorbent in the *materia medica*, being especially useful in the third stage. It is recommended by Eidherr when exudation sets in, indicated by the appearance of the crepitant râle.

Special symptoms are to be dealt with precisely as directed under *Broncho-pneumonia*.

Emphysema.

Overdistention of the air-vesicles of areas of pulmonary tissue occurs as a complication of almost any of the acute

* "Homœopatische Therapie."

affections of the respiratory tract, resulting from either an interference with the function of a considerable portion of the lungs (*vicarious* or *inspiratory emphysema*), or from an obstruction higher up in the tract, leading to dilatation and even rupture of air-vesicles during expiration, especially when this is performed in a forcible manner. The latter variety, or *expiratory emphysema*, is by far the most pronounced form in which this condition is met with acutely, occurring as a common complication of whooping-cough, croup, asthma and measles, especially in rachitic children or those of loose fibre. It has also resulted from forcible expiratory efforts performed voluntarily, and from the inflation of the lungs of the new-born in cases of asphyxia. Chronic emphysema is occasionally seen in children as a result of chronic bronchitis and organic heart disease.

Anatomically, emphysema is classified as *vesicular*, or *alveolar*, and *interstitial*. In the latter form there is an escape of air into the connective-tissue stroma of the lungs, sometimes burrowing beneath the pleura and along the mediastinum into the subcutaneous tissue of the supra-clavicular spaces. Only then can it be distinguished clinically from the vesicular form when it makes its appearance externally, in the above manner.

The *chronic* form, or *substantive emphysema*, is defined by Delafield* as a chronic interstitial inflammation of the lungs, in which the dilatation of the air-spaces is a secondary phenomenon. Accordingly, it is a condition with the same etiology and pathology as chronic endocarditis, endarteritis and nephritis.

In acute emphysema the upper lobes are principally affected, and most markedly in their anterior borders. In the chronic form both lungs are more or less affected in their entirety, but seldom to the great extent observed in adults.

* "American Text-Book of Practice."

The *symptoms* of a compensatory emphysema are always obscured by the original disease. Hyper-resonance, bulging of the supra-clavicular space during the expulsive efforts of coughing, exaggerated vesicular murmur and dyspnœa are all suggestive.

Chronic emphysema presents the typical barrel-chest; feeble respiratory murmur with prolonged expiration; diminished area of cardiac dullness; cyanosis, dyspnœa, cough and expectoration; vesiculo-tympanitic percussion-note. It must be remembered, however, that none of these signs are as pronounced as in adults, and the younger the child, the less the aberration from the normal.

In both instances treatment is to be directed to the primary disease.

Such remedies as *arsenicum*, *arsenicum iodide*, *aurum mur.*, *ipecac*, *lobelia* and *grindelia* will be required for the symptoms of the disease *per se*. *Coca* and *quebracho* are lauded by Hale* as the only remedies giving continuous relief.

Constitutional remedies are valuable in rachitic children, notably the *calcareas*, *silicea*, *ferrum phos.*, *baryta carb.* and *iodide*, *fluoric acid* and *sulphur*.

Pleurisy and Empyema.

Inflammation of the pleura is rarely seen as a primary disease during childhood, but it is quite a common accompaniment of pneumonia, especially of severe forms of broncho-pneumonia. Pleurisy without exudation accompanies pulmonary disturbances of all kinds, and the frequency with which adhesions and thickening of the pleural membranes are encountered in the general run of autopsies upon children points to the great prevalence of this condition.

The exudative variety of pleurisy in children is almost invariably an empyema, and occurs most frequently as a complication of pneumonia, or develops simultaneously

* "Practice of Medicine."

with the pneumonic process, viz., the *pleuro-pneumonia* described by some authors as a separate clinical condition.

The acute infectious fevers are responsible for the development of some cases of pleurisy, and in older children a purely serous effusion may occur as a result of tuberculosis or the rheumatic diathesis.

The micro-organisms playing the most prominent rôle in the etiology of purulent pleurisy are the *pneumococcus*, the *pyogenic micrococci* and the *bacillus tuberculosis*, mentioned in the order of their importance.

Pathology.—In the early stages of a pleurisy the membrane appears injected and lustreless; later, it becomes roughened and coated with a layer of fibrinous exudate. The extent of this process depends upon the severity of the attack, and it will vary from a delicate film of fibrin coating only that portion of the pleura directly covering the affected portion of lung in a pneumonia, to a general involvement of the entire pleural cavity, with a thick layer of inflammatory products plus an abundance of sero-pus. In these pronounced cases the pleura appears coated with a yellowish-green deposit of varying thickness; the opposing surfaces may become adherent, forming pockets in which an abundance of pus is found. If serum is poured out freely during the first stage, adhesions do not occur, at least not to a very great extent. This fluid soon becomes purulent from the free admixture of leucocytes.

Symptomatology.—An attack of pleurisy may be ushered in with repeated chills, as in adults, or with convulsions, which are especially common in infants. A dry, hacking cough, and sharp, sticking pains in the side are the natural accompaniments of the inflammatory process. In cases of a free exudation taking place the pain disappears, but with this a new series of symptoms develop. The pain is expressed by severe crying after each coughing paroxysm or when the child is moved; there is also a tendency to lie upon the affected side, together with increased abdom-

inal breathing. If the child be old enough to express its suffering it may mislead us by referring the pain to the epigastric region.

With the appearance of fluid, which is mostly of a purulent nature, dyspnœa develops, its severity depending upon the amount of fluid present. The cough may become more and more severe, owing to a complicating bronchitis.

The fever is remitting in character, seldom very high, rarely running above 103° F. As the acute symptoms subside, a slight afternoon rise may remain to indicate that the condition has become chronic, as it is very rare for an empyema to recover spontaneously. Cases of pleurisy, fully recovering within a short period of time and without surgical treatment, have been either a dry pleurisy, a pleuro-pneumonia with scanty exudate, or a serous pleurisy.

When pleurisy develops secondarily to another disease, its course is not essentially different from the above; thus, in a pneumonia there will be a post-critical rise in the temperature with all the attending symptoms of pleurisy. Sometimes, however, it is impossible to say just when the pleurisy has developed, the increasing dyspnœa, pain and cough indicating the addition of this serious complication. This frequently occurs in broncho-pneumonia; and as both conditions are then practically inseparable, the term *pleuro-pneumonia* has been rightly applied here.

The *physical signs* by which pleurisy is recognized are mainly those indicating the presence of fluid in the thoracic cavity, as the early signs, namely, the friction-sound and local tenderness, are not so readily elicited in children as in adults. Conditions in which subcrepitant râles are present are a frequent source of error, they being easily mistaken for friction-sounds during infancy. For this reason the diagnosis of pleurisy depends upon a correct interpretation of painful inspiration, painful cough, the characteristic onset and fever, and, still later, the demonstration of a pleuritic exudate.

If the amount of fluid be considerable, there will be a noticeable bulging of the chest on the affected side, together with diminished motion. When the fluid occupies the left pleural cavity the heart is displaced to the right; when occupying the right pleural cavity there is a downward displacement of the liver.

Vocal fremitus is absent over the site of the fluid, while the percussion-note is flat and there is increased resistance. Above the level of the fluid tympanitic resonance is obtained when the lungs are not entirely deprived of air. The line of flatness will change its direction with a change in the position of the patient, providing the fluid is not inclosed by inflammatory adhesions.

In fresh cases bronchial breathing is very frequently heard above the line of dullness, which only gradually gives place to the entire disappearance of the respiratory murmur with the increase in the exudate.*

In children under three years the fluid is most likely to be purulent, and even until puberty there is a tendency for it to be so. Subcutaneous œdema of the thorax on the affected side is not so commonly present in children as in adolescents and adults to indicate the purulent nature of the exudate. A positive diagnosis cannot, however, be made without the use of the aspirating needle, which is perfectly safe when used under proper aseptic precautions. In old cases, where the pus is too thick to be drawn into the needle, even this method will lead to error unless the negative result is properly interpreted. In a serous exudate, the presence of chain cocci, staphylococci, or the diplococcus pneumoniae, indicates that it will become a purulent one.—(KOPLIK.†)

Prognosis.—Serous effusions are usually absorbed readily, and it is very rare for them to become purulent. With an empyema, however, the prognosis is not so favorable, and

* Henoeh, "Vorlesung, über Kinderkrankh."

† "Amer. Text-Book, Diseases of Children," 1898.

absorption seldom takes place, although the case may recover spontaneously by evacuation through the chest wall (usually in the region of the fourth or fifth rib) or through the bronchial tubes, by perforation into the lung parenchyma; but even these cases frequently die, and unless proper surgical treatment is instituted early, the chances for recovery are not good. At times perforation into the peritoneal cavity takes place with a fatal result. The usual cause of death in an untreated empyema is the gradual exhaustion or amyloid degeneration accompanying prolonged suppuration. Tuberculosis is also liable to supervene.

When the fluid is removed early there is a fair chance for the compressed lung being restored to complete function; on the other hand, if the condition has been one of long standing, dense bands of adhesions have generally been formed to such an extent as to allow of but a partial inflation of the lungs, resulting in permanent deformity of the chest and spine.

Treatment.—Local treatment is of little avail in children, with the exception of the judicious use of hot applications and a flannel binder in the early and painful stage. Fluid which is present in considerable amount should be promptly evacuated if absorption is not progressing rapidly; under no circumstances should accumulations of fluid be allowed to remain in the chest for a period exceeding two weeks, unless decided improvement is noted daily. As the accumulations are almost invariably purulent in character, they are difficult to absorb.

Sometimes a partial removal of the fluid by aspiration produces sufficient relief of the intrapleural tension to excite the activity of the absorbents and lead to a complete recovery. By this method undoubted cases of empyema have been cured without open drainage.—(GOODNO.*)

* "Practice of Medicine."

In cases of long standing, however, and in serous pleurisies of large effusion, displaying a tendency to rapid recurrence after aspiration and producing alarming pressure symptoms, open drainage is to be instituted. *Simple incision*, when practiced under the strictest antiseptic precautions, yields such prompt and lasting results that it has to a great extent superseded the operation for the *resection of a rib*. One of the advantages which this operation offers is the foregoing of the use of a general anæsthetic, the local use of ethyl chloride or cocaine being all-sufficient. The incision is made in the fifth intercostal space anteriorly, or in the sixth space in the axillary line, close to the upper border of the rib, one and a half inches in length. Before making the incision it is always advisable to use the exploring-needle. A large drainage-tube, or two smaller ones placed side by side, are inserted into the pleural cavity, their free ends being transfixed with a safety-pin to prevent accidental displacement. After the fluid has been evacuated a sterilized or bichloride gauze dressing is applied over the wound, the dressing being renewed as it becomes saturated. In rare cases, most likely those which have been treated too late, relapses occur on the removal of the drainage-tubes, necessitating the resection of a rib; and if the lung has become markedly crippled, leaving an open cavity in spite of complete recession of the affected side of the thorax, the operation of Estlander is to be considered.

Aconite, arnica, belladonna, bryonia, kali carb., rhus tox., scilla and *tartar emetic* will be found useful for the early symptoms, they having a special relation to the inflammatory stage.

When exudation is abundant, *apis, arsenicum, cantharis, kali hydroj.* and *sulphur* are most frequently indicated.

In purulent collections, one of the constitutional remedies, prescribed upon the temperamental and diathetic peculiarities of the patient, will yield most gratifying results

and greatly hasten the progress of the case. *Ars.*, *ars. iod.*, *calc. c.* and *phos.*, *hepar*, *iodium*, *mercurius*, *silicea* and *sulphur* stand prominently among these.

Acon.—Sharp, stitching pain in side; high fever, restlessness and chills; after exposure to cold, dry winds or checked perspiration.

Apis.—Pleuritic effusion; scanty urine.

Arnica.—Traumatic cases; hæmorrhagic effusion.

Arsenicum.—Profuse serous effusion; dyspnœa; cachexia; prostration; empyema. The *iodide of arsenic* is well suited to tuberculous cases, as is also *iodoform*.

Asclepias tuberosa.—Sharp, stitching pains in the side; dry, hacking cough. Complicating pneumonia and tuberculosis.

Bellad.—Cerebral symptoms; complicating the infectious fevers or exanthemata.

Bryonia.—Early stage of all pleurisies, and in dry pleurisy frequently to the end. *Sulphur* is needed in the latter cases to complete the cure. Sharp, stitching pains, aggravated by motion and deep breathing; friction-sounds and local tenderness.

Calc. c.—To absorb the pleuritic exudate. Scrofulous and rachitic diathesis.

Canth.—Profuse serous exudation; frequent cough; dyspnœa; palpitation; profuse sweats; great weakness; tendency to syncope; scanty and albuminous urine.—(E. FAIVRE.)

Carbo. veg.—Old cases with hectic fever; prostration; sallow complexion and sunken features; ichorous degeneration.

Colchicum.—Rheumatic diathesis; sour-smelling sweats; scanty, red, turbid urine, with abundant uric acid and some albumin.

Hepar.—Purulent accumulations; also dry, croupous exudate; abscess of the lungs; hectic fever. “*Hepar* will often help to clear up the confirmed cases of purulent

pleurisy where galloping consumption is apparently threatening."—(FISCHER.) Compare *lachesis*.

Kali carb.—Violent stitching pains, especially on left side, worse in early morning (after fresh adhesions have formed during sleep), accompanied by dry cough and palpitation of the heart. When *bryonia* fails to give relief.

Kali hydr.—Serous exudations.

Mercurius.—Syphilitic or rheumatic diathesis; pains persisting after the fever subsides; constant chilliness, with tendency to sweat; gastro-intestinal catarrh; perihepatitis. *Merc. corr.* is useful in pleuritic effusions accompanying parenchymatous nephritis.

Phosphorus.—Complicating broncho-pneumonia. Pain in mid-sternal region and on both sides, especially when coughing. Also in empyema with Bright's disease; hypertrophy of right heart; amyloid changes. Hard, dry, distressing cough with hoarseness.

Rhus tox.—Acute rheumatic cases, after exposure to wet or after physical overexertion. General aching and prostration; typhoid state.

Scilla.—Sharp stitching pains in side with broncho-pneumonia; prostration; cardiac weakness. Cannot lie on left side.

Sulphur.—Later stages of dry pleurisy and after the effusion makes its appearance in the exudative variety. Sulphur is a most valuable absorbent, and we are always obliged to come back to this remedy when others fail to improve the condition, or when clear indications for others are not present.

Tartar emet.—Pleuro-pneumonia; early stages.—(KAFKA.)

CHAPTER XII.

DISEASES OF THE HEART AND ITS MEMBRANES.

THE heart affections of childhood are both congenital and acquired. Congenital affections may be either the result of foetal endocarditis or developmental defects and abnormalities. Acquired heart disease presents the same pathological phenomena observed in adult life, with, however, such clinical deviations from the adult type of a given disease as must necessarily result from the physiological peculiarities of the circulatory apparatus distinctive of child-life. Functional disorders are also encountered, but with greater rarity than in adult life, as the common causes for this train of symptoms, viz., abuse of coffee, tea, tobacco and alcoholics, also neurasthenia and hysteria, are infrequently active at this age. Reflex irritation, however, is a frequent source of cardiac symptoms in the child, notably gastrointestinal irritation, helminthiasis and teething.

The heart is relatively larger in infancy than in later life, and its position is higher and more horizontal at this period. It may be said that the smaller the child, the higher up and further to the right will cardiac dullness be found. Up to the sixth year dullness may extend beyond the right border of the sternum, and the apex is generally found outside of the left nipple-line up to the fourth year. Again, the apex may be in the fourth intercostal space until the sixth or seventh year. After the seventh year, however, it should be located well within the left nipple line and in the fifth intercostal space, to indicate a perfectly normal condition.

The child's heart exhibits a greater resistance to organic disease than the adult's. The explanation of this is, ac-

according to Soltman,* the abnormal elasticity of the great vessels, the relatively greater muscular development of the heart, and the relation of the ventricles to one another. Intra-ventricular pressure has long been held to exert a pronounced influence in the development of endocarditis and its deformities, as shown by the overwhelming frequency with which it is found in the left heart after birth, and in the right during intra-uterine life.

The characteristics of cardiac murmurs (excluding those due to congenital defects) are summarized by Soltman as follows:

Anæmic murmurs are rare in the first four years, and even up to the eighth year, but they are comparatively common at puberty, at which time anæmia and chlorosis are prevalent. The low blood-pressure in the ventricles and large source of origin of the great blood-vessels in early childhood explains their infrequency, the reverse condition obtaining at puberty. They are heard loudest at the pulmonary valve, and are systolic. There must be no heaving impulse, accentuated second sound, or extension of the apex-beat beyond the mammillary line.

Cardio-pulmonary murmurs (HOCHSINGER) are produced by the transmission of the contractions of the heart and its movements to the lungs. These murmurs are also systolic, and are differentiated from anæmic murmurs by their definite relation to the respiratory function, being increased during forced and suspended by a cessation of respiration. They are common in children with deformed chests, due to rickets or Pott's disease.

Endocarditic systolic murmurs are heard in mitral insufficiency; and for a long time this sign, together with a heaving impulse, may be the only symptoms of endocarditis, cardiac enlargement, accentuated second sound and increased tension in the pulmonary artery being absent.

* "Der Kinderarzt," ix., No. 2, 1898.

Other murmurs which may be heard in chronic valvular disease are the *presystolic*, which does not invariably indicate mitral stenosis,* and the *diastolic*, which likewise may exist without aortic insufficiency, resulting from high pressure in the pulmonary artery, the murmur being conducted to the apex.—(STEELL.)

Congenital Diseases and Deformities.

As has been said above, congenital heart affections result from either foetal endocarditis or interrupted or abnormal development. Frequently, however, both of these processes act together—a mechanical obstruction in the circulation, as a result of endocarditis, leading to non-closure of the auricular and ventricular septa or the ductus arteriosus. For this reason it is more common to find a combination of defects rather than an uncomplicated lesion. Thus, Holt† found, from an analysis of 242 cases, that the most frequent lesions were a combination of pulmonic stenosis with defective ventricular septum; pulmonic stenosis, with defective auricular septum; the three lesions associated, or the first two with a patent ductus arteriosus.

Foetal Endocarditis.—Inflammation of the endocardium in the foetus is of the chronic or sclerotic variety, verrucose endocarditis being very rare.—(OSLER.‡) Small, nodular bodies, the remains of foetal structure (BERNAYS), and small, rounded, bead-like bodies of a deep purple color, which are the remnants of a hæmorrhage (OSLER), have frequently been mistaken as evidences of endocarditis, leading to a misconception as to the prevalence of this affection. The characteristics of foetal endocarditis are thickening of the segments of the valves, their edges becoming rounded and shrunken. The semilunar valves become obliterated, leaving a stiff, contracted ridge at the

* Ashby and Wright.

† "Diseases of Infancy and Childhood."

‡ "Keating's Cyclopædia."

orifice of the great vessels. The right heart is most liable to endocarditis, as well as to errors of development.

Congenital Anomalies.—Mentioned in the order of their frequency, according to Holt, congenital anomalies of the heart may be classified as follows:

1. Defect in the Ventricular Septum.
2. Defect in the Auricular Septum, or Patent Foramen Ovale.
3. Pulmonic Stenosis, or Atresia.
4. Patent Ductus Arteriosus.
5. Abnormalities in the Origin of the Great Vessels.
6. Pulmonic Insufficiency.
7. Tricuspid Insufficiency.
8. Tricuspid Stenosis, or Atresia.
9. Mitral Insufficiency.
10. Mitral Stenosis, or Atresia.
11. Aortic Insufficiency.
12. Aortic Stenosis, or Atresia.
13. Transposition of the Heart.
14. Ectocardia.

Defect of the ventricular septum is most frequently associated with pulmonic stenosis or defect of the auricular septum. The defect is most frequently found in the anterior muscular portion of the septum.—(ROKITANSKY.) If compensatory hypertrophy of the right ventricle supervenes, no apparent symptoms may be present. Cyanosis results from an obstructed venous circulation, with embarrassed respiration, cyanosis and œdema. This, and not the mixing of arterial with venous blood, is the cause of the cyanosis.—(BAGINSKY.)

Patency of the foramen ovale may exist without any evidence of cardiac disease. When, however, other anomalies increasing the pressure in the right auricle coexist, a mixing of venous and arterial blood takes place, with resulting cyanosis. Under these circumstances the child is liable to an early death.

Stenosis of the pulmonary artery is one of the commonest of congenital heart affections, as a rule being responsible for the existence of the above-mentioned anomalies. The usual cause for the stenosis is endocarditis, although there may be a developmental defect of the pulmonary artery or of the conus arteriosus. The symptoms depend upon the amount of constriction at the pulmonary orifice. The infant may die shortly after birth with intense cyanosis and asphyxia, or it may grow up to adult life, with, however, signs of deficient aeration of the blood, cyanosis from undue physical exertion, coldness of the extremities, clubbing of the finger-nails, and mental and physical apathy.

Patent ductus arteriosus does not necessarily produce symptoms. Hirst* finds a certain degree of patency of the duct quite common in children during the first year of life, but in these cases there is no appreciable deviation from the normal circulation. The symptoms produced are hypertrophy and dilatation of the right ventricle; dilatation of the pulmonary artery; dyspnoea and cyanosis; bronchitis. The physical signs are pronounced.

Abnormalities in the origin of the great vessels are rare, and lead to early death or make extra-uterine life impossible, unless there is an open foramen ovale or a communication between the pulmonary veins and the right side of the heart.

Tricuspid insufficiency and stenosis are grave defects, resulting from endocarditis. There may be complete atresia of the orifice, in which case a degree of circulation is maintained through an incomplete ventricular septum. The right heart becomes dilated and hypertrophied; there is cyanosis and tendency to venous hæmorrhages.

Affections of the *left heart* are rarer than those of the right, and result likewise from endocarditis. The symptoms and physical signs are the same as observed later in life.

* "American Text-Book of Diseases of Children."

The *symptoms* of congenital heart affections may be summed up in a general way as the indications of deficient aeration of the blood or a mixing of venous with arterial blood, and interference in the systemic circulation. Cyanosis is the most persistent symptom, and is, in fact, pathognomonic of congenital heart disease in the absence of other causes capable of exciting this phenomenon. Among these may be mentioned pneumonia, asphyxia, bronchitis, atelectasis, congenital pleurisy, partial occlusion of the trachea, degeneration of the blood, interference with the nerves of respiration.—(HIRST.)

Dyspnœa is another prominent symptom. Among the later manifestations of congenital heart disease are clubbing of the finger-nails, cold extremities, mental and physical apathy, deformity of the chest from hypertrophy, and dilatation of the heart. Hypertrophy will produce deformity of the sternum up to the third year.—(ROTCH.*)

The first symptoms are usually noticeable at birth, the child being a so-called “blue-baby.” At other times they are very mild, and are only noticed when the child becomes excited or attempts physical exertion. Again, the defect may not be suspected until an acute affection of the respiratory tract precipitates the symptoms, or it may not become apparent until the child grows up.

The *diagnosis* rests upon a recognition of the above-mentioned symptoms, together with the physical signs. According to Sansom, a *patent foramen ovale* is to be recognized by cyanosis without a heart murmur (in which case we must necessarily exclude all other causes for cyanosis), or by cyanosis with systolic and presystolic murmurs over the cartilages of the third and fourth ribs. The same observer also claims that *defective ventricular septum* is diagnosed by a loud systolic murmur over the præcordium and between the shoulders, not transmitted to the vessels.

* “Pediatrics.”

In *tricuspid stenosis and insufficiency* there is hypertrophy and dilatation of the right heart; labored heart's action; præcordial thrill; loud systolic and diastolic murmurs at the apex.

Stenosis of the pulmonary artery presents a hypertrophied right heart; loud systolic murmur over the second and third costal cartilages to the right of the sternum, not transmitted into the carotids, and præcordial thrill.

Patency of the ductus arteriosus leads to rapid hypertrophy of the right ventricle and dilatation of the pulmonary artery; increased area of cardiac dullness; long-continued systolic murmur with thrill; cold surface.

The *treatment* must aim at a betterment of the condition of the circulation through compensatory changes in the heart, and protection against external influences and physical overexertion. Acute affections of the respiratory tract are especially to be feared. Attacks of cyanosis or threatened cardiac failure and dyspnœa will call for stimulation with either aromatic spirits of ammonia or brandy.

On general lines, *aconite*, *arsenicum*, *camphor.*, *cuprum*, *digitalis*, *glonoin*, *lachesis*, *rhus tox.* and *veratrum viride* are to be considered, their symptomatology covering the conditions met with in these cases, namely, hypertrophy, dyspnœa, excessive heart-action, cyanosis, etc.

“In new-born children, where the foramen ovale has not closed, *lachesis*. In consequence of persistence of the ductus Botalli, *laurocerasus*.”—(C. G. R.)

Pericarditis.

Pericarditis in infancy is almost invariably seen as a complication of pneumonia, especially those severe pneumonias in which the pleura is notably involved (pleuro-pneumonia). Later on it will be seen secondary to rheumatism, pleurisy, scarlet fever and tuberculosis. Of all of the causes capable of exciting a pericarditis, rheumatism is the most important, and a certain amount of pericardial

involvement is always to be suspected in severe cases of rheumatic endocarditis, although under these circumstances effusion seldom takes place.

Traumatism and caries of the ribs or vertebræ are local causes which may excite a pericarditis.

The usual pathological changes occurring in inflammations of serous membranes are to be seen in pericarditis, with the same peculiarities noticed in cases of pleurisy, namely, that effusion takes place readily, showing a strong tendency to become purulent. The dry stage is of short duration. Adhesions form to a greater or less degree in all cases which recover from the acute symptoms. This leads to hypertrophy of the heart, or dilatation from interference with the nutrition of the myocardium. When absorption of the effusion is delayed, *myocarditis* develops as a rule, leading to dilatation.

Symptomatology. — The early symptoms of a pericarditis are rarely recognized in an infant, owing to their obscurity and the overweighing symptoms of the disease to which it is secondary.

If the child is old enough to complain of pain in the region of the heart, which may also be referred to as radiating to the left shoulder or epigastrium, or as occurring alone in these locations, a careful physical examination will reveal local tenderness and possibly cardiac friction-sounds, beside directing our attention to the fixation of the left side of the thorax. If friction-sounds are elicited, they will be heard as a rubbing or creaking sound synchronous with the heart's action and independent of respiration. They are most distinct under the fourth rib to the left of the sternum, and may simulate a mitral regurgitation murmur. However, cardiac friction-sounds do not only accompany the heart-sounds, but they are prolonged beyond them, being interposed and at times occupying the whole duration of the cardiac action.—(SKODA.)

With the appearance of the effusion the pulse, which

was at first full and irritated, becomes feeble and irregular. Oppression, dyspnœa and cyanosis develop with the outpouring of sufficient fluid to embarrass the heart's action; and eventually convulsions, and in older children delirium and coma, close the scene in fatal cases. The pulse is of the greatest importance in recognizing acute inflammatory affections of the heart, being strongly suggestive of such a complication when irregularity and enfeeblement suddenly develop during an acute illness. Bulging of the præcordial region, increased area of cardiac dullness, and muffling of the heart-sounds and impulse are only to be elicited in severe cases. The two last signs are notably difficult to determine on account of the natural resiliency of the child's thorax and the greater accommodation possible under reverse conditions.

Adhesions are to be suspected when there is a displacement of the apex not due to marked hypertrophy, or dilatation and retraction of the intercostal space during systole.

The *prognosis* of pericarditis is always grave, particularly when complicating pneumonia and scarlet fever. The liability to myocarditis and the permanent changes in the pericardium must also be taken into account.

Treatment.—The child must be kept as quiet as possible during the active symptoms, and in case of recovery any physical exertion must be forbidden until every danger from cardiac dilatation is past. Hot applications to the præcordium are of decided advantage in older children. Purulent collections in the pericardium which fail to become absorbed rapidly are less favorably treated surgically than pleural effusions, for which reason every effort should be made to overcome this condition remedially before resorting to aspiration.

Acon.—Chilliness; hard, bounding pulse; sharp pain in region of heart; great restlessness and sighing; dyspnœa and syncope. Useful in the earliest stages.

Arsen.—Great anguish and oppression; constantly changing position; cyanosis; thirst; in consequence of repelled exanthems, or in connection with pneumonia; stage of effusion.

Bryonia.—This remedy follows well after *aconite*, and is most applicable during the stage of effusion, although it seldom absorbs the exudate completely. *Sulphur* is a most valuable remedy for this purpose, especially when the case becomes protracted.

Cactus grand.—Sensation of constriction about the heart, as if an iron hand were grasping it. There may also be a sense of deep-seated soreness in the præcordium, with dyspnoea; attacks of suffocation; fainting; small, irregular pulse.

Digitalis.—Copious serous effusion; small, intermitting pulse; diarrhoea and vomiting; syncope.

Iodium.—Complicating croupous pneumonia. Violent palpitation and oppression from slightest motion; must lie perfectly quiet on back.

Spigelia.—After *aconite*, when the friction-sound becomes audible. Sharp, stitching pains in the chest. *Spigelia* is a most efficient remedy for the painful stage, controlling the pains promptly.

Beside these are to be considered *asclepias tuberosa*, *bell.*, *cannab.*, *canth.*, *kali carb.*, *lach.*, *merc. cor.*, *veratr. vir.*

Endocarditis.

Endocarditis is more liable to develop during the course of a rheumatic fever in children than in adults, but as the rheumatic condition is not as typical in children as in adults, this relationship is often overlooked. Likewise endocarditis is frequently associated with chorea and erythema nodosum, and recurring crops of subcutaneous fibrous nodules about the joints are taken as an indication of a progressive cardiac affection.

Endocarditis is in all probability of infectious origin, the

severer forms, known as ulcerative or malignant endocarditis, being the result of infection with pyogenic cocci or with the pneumococcus of Fränkel. In simple endocarditis Sängner and Fränkel have been able to demonstrate bacteria, and according to Eichhorst* no distinction can be made between the group of micro-organisms capable of exciting the ulcerative variety in one case and simple endocarditis in another. The frequency with which the endocardium is attacked during the course of a rheumatic fever is readily interpreted by accepting in acute rheumatism an infectious disease, the result of specific bacteria, which attack with preference the serous membranes. Outside of rheumatism endocarditis is seen with scarlatina, pneumonia, diphtheria, nephritis and septicæmia, in which case it is usually of a severe type. The ulcerative variety is also frequently associated with wound infection, and always partakes of the nature of a septic condition.

In simple or verrucose endocarditis the valves become covered with inflammatory excrescences—endocardial vegetations. Owing to destructive changes in the endothelial cells and consequent roughing of the surface of the valves these fibrinous formations are deposited from the circulating blood. At the same time the valves become thickened and distorted from interstitial cellular proliferation and vascular engorgement. Portions of the fibrous vegetations may become detached and swept into the general circulation, producing an embolus at some distant point. The mitral valve is the most frequent seat of the endocarditic process, next in frequency being the aortic valves. Right-sided endocarditis has been discussed under *Fatal Endocarditis*.

The generally accepted explanations given for the almost invariable occurrence of post-natal endocarditis on the left side of the heart, namely, that owing to the greater strain

* "Specielle Pathologie u. Therapie."

brought upon the left ventricle to sustain the circulation or the existence of lesions upon the left side of the heart favoring the inroads of micro-organisms, the opposite condition obtaining during foetal life, does not, to my mind, satisfactorily cover the grounds. In the light of the most recent investigations into the etiology of endocarditis, which unquestionably stamp it as an infectious disease, it would seem most plausible to suppose that the germs which excite the inflammatory reaction in the endocardium can only thrive in a medium of arterial blood, which is offered in the most perfect manner in the left auricle and ventricle. The endocardium itself is poorly supplied with blood, and for this reason the bacteria find it impossible to develop in the right chambers of the heart, which contain the impure blood. During foetal life, however, the right auricle receives the freshly oxygenated blood directly from the placenta, and so we have a predominance of endocardial inflammation upon this side until the mode of circulation becomes altered by the establishment of pulmonary respiration.

In malignant or ulcerative endocarditis the inflammatory state is more pronounced, being coupled with ulcerative and even suppurative processes in the endocardium.

Symptoms.—The onset of an endocarditis is always insidious, and especially when complicating another acute affection is its presence liable to be overlooked. Nor may symptoms point to an endocarditis until positive cardiac damage has been sustained, or not until a thorough physical exploration discovers a pronounced murmur, may our attention be directed to the affection.

Endocarditis should be suspected if, during an acute infectious disease, there is an abrupt rise in the temperature with increased and weak pulse, præcordial distress and dyspnoea. In children of the rheumatic diathesis, a fever rapidly attaining a height of 104° to 105° , together with tonsillitis, is frequently accompanied by a severe endocarditis, in the

absence of all articular symptoms.—(PEPPER.) The pulse, which at first is strong, and possibly slow in comparison to the temperature range, soon becomes rapid and feeble, even dicrotic. A certain amount of myocarditis always accompanies endocarditis, and when cardiac weakness becomes extreme it can be suspected existing to a considerable degree.

Præcordial distress and dyspnœa are the usual accompaniments of endocarditis, which, together with flushed face, and the peculiarity of the pulse above referred to, are strong indications of this disease. The distress sometimes amounts to actual pain, which in young children may be referred to the epigastrium.

The pathognomonic symptom of endocarditis is the characteristic bruit, also described as the bellows murmur, from its soft, blowing character. The murmur is systolic and is heard best at the apex. Endocarditis may, however, exist without this murmur being perceptible, as the subsequent course of the disease will show; and, again, during the infectious fevers a murmur is frequently heard, but it disappears during convalescence, leaving no trace of valvular defect behind, an autopsy entirely failing in these cases to demonstrate an inflammatory condition.

According to Dr. O. Sturges,* a faint murmur heard at the top of the ensiform cartilage, indicating regurgitation at the tricuspid orifice, due to back pressure through the lungs, can in some cases be heard to precede the mitral bruit.

With malignant endocarditis the symptoms of septicæmia become prominent; the temperature is intermittent, and there is enlargement of the spleen and albuminuria, beside a strong tendency to embolus formation in the brain or in other important organs. Such cases are fatal, as a rule, while in a well-managed case of simple endocarditis the prognosis as to life is always favorable, and the ultimate

* Ashby and Wright.

outcome as regards permanent valvular defects is also favorable—much more so in children than in adults.

Treatment.—An essential element in the successful treatment of endocarditis is absolute rest, as any physical exertion capable of exciting the heart to increased action will necessarily exert a baneful influence upon the inflammatory process. The body surface must be carefully protected against chilling influences, and long-continued rest even during convalescence is at times imperative, particularly when myocarditis is suspected.

Aconite, *belladonna* and *veratrum viride* in the early stages, and later *spigelia*, *spongia*, *cactus*, *bryonia* and *colchicum* are the most important remedies. After the acute symptoms have subsided much of the damage to the heart naturally to be expected can be prevented and overcome by the judicious choice of a remedy capable of absorbing the inflammatory products and correcting the resulting disturbances. It is rarely difficult to obtain sufficient data for such a prescription, and here *aurum*, *iodium*, *spongia*, *sulphur*, *calc. carb.*, *lachesis*, *arsenicum* and *arsenicum iod.* are the most frequently indicated drugs. *Kali mur.* exerts a specific action upon the heart-muscle, and is recommended to prevent dilatation taking place.

Acon.—Chilliness; hard, wiry pulse with high fever, restlessness and dyspnœa. *Veratrum viride* has less of the restlessness; the arterial tension is extreme and cerebral symptoms may supervene, and, although it controls excessive cardiac action promptly, its influence upon the inflammatory process and the fever is below that of *aconite*.

Belladonna.—Full, bounding pulse; flushed face; skin hot and moist; delirium.

Bryonia.—Purely rheumatic cases; pericarditis and endocarditis; sharp pains in heart, relieved by lying upon the affected side; tongue dry and coated; great thirst; no desire to move.

Cactus.—Sense of constriction in region of heart; oppression of breathing. (See *Pericarditis*.)

Colchicum.—Rheumatic endocarditis; tearing pain in region of heart; small, thready pulse.—(JOUSSET.)

Iodium.—Purring sensation in region of heart on palpation; violent palpitation and dyspnœa, even to fainting, on slightest exertion, with pneumonia. If *spigelia* does not give relief within a reasonable period of time.—(KAFKA.)*

Kali carb.—Blowing systolic murmur with accentuated pulmonary sound; pulmonary engorgement; weakness of the heart-muscle, with anasarca of feet and ankles (*bry.*).

Spigelia.—Undoubtedly the most important remedy in endocarditis as well as pericarditis. It should be given as soon as the condition becomes recognizable, in the absence of strong indications for another remedy.

Spongia.—Paroxysms of oppression and pain in the heart; inability to lie with the head low, or even complete inability to lie down on account of the choking paroxysms induced thereby.

Chronic Heart Disease.

Chronic acquired heart disease is the sequel to inflammatory affections of this organ, notably endocarditis. The lesions which may be encountered are thickening and distortion of the valves; fibrinous or calcareous deposits upon the valve-leaflets; hypertrophy of the walls, dilatation of the chambers; adherent pericardium. These changes are usually seen in various stages of development, and in pronounced cases they may all be demonstrated in different portions of the organ. The mitral valve is by far the most frequently affected seat of lesion, the aortic valve being rarely affected, and when so, more often in association with mitral involvement than alone. The changes in the valves above referred to lead either to regurgitation or obstruction at the orifices.

Symptoms.—The history of an organic heart affection can be described in three stages, constituting the classical

* “Homœopatische Therapie.”

course pursued by this disease. The first stage marks the onset, being the acute inflammatory stage, which leads either to immediate damage to the valves or to chronic endocarditis. The rheumatic diathesis underlies the vast majority of all cases of recurring or chronic endocarditis, and it is usually possible to obtain a previous history of rheumatic symptoms, such as recurring acute tonsillitis, arthritis, erythema, fibrous nodules, chorea, etc., or note the later development of the same in a case of valvular heart disease.

The second stage is that of compensation, during which the heart adapts itself to the extra strain brought upon its muscular walls incident to the leakage or obstruction at its orifices. When compensation is perfect there are naturally no symptoms; but as this is seldom the case, the patient suffers from shortness of breath on exertion, palpitation, attacks of epistaxis, bronchitis, indigestion.

The stage of failing compensation is the period at which the heart becomes incompetent to maintain the circulation, in consequence of which the arteries are but imperfectly supplied with blood and the veins become overfilled. Although the patient may be abruptly thrown into this stage by undue physical exertion or an attack of endocarditis, pneumonia, typhoid fever or scarlet fever, the usual course is that of a progressively-increasing cardiac weakness, hastened by an impairment of the general nutrition, anæmia, intercurrent diseases, etc.

The symptoms of cardiac incompetency, when of gradual onset, will show themselves in dropsy of the lower extremities; difficult breathing from the slightest physical exertion and when lying on the back; cough, with frothy, blood-streaked expectoration; flatulent indigestion; scanty urine and albuminuria. When of sudden onset, there is marked dyspnœa and cyanosis; the lungs are the seat of venous engorgement, which frequently leads to pulmonary œdema and death.

The imperfect circulation resulting from valvular disease leads to an interference in the general nutrition as well as to important visceral changes. To the former belong clubbing of the fingers and stunted growth, and to the latter chronic bronchitis, chronic congestion of the spleen, liver and kidneys.

The *prognosis* of organic heart disease is never favorable, as complete recovery is impossible, and the possibility of renewed attacks of endocarditis, and other factors capable of rupturing compensation, must be a constant menace to the child's condition. The course is usually a progressive one, and puberty seems to exert an unfavorable influence upon the disease. Nevertheless, well-managed cases may attain adult life with safety, and by the maintenance of a good general nutrition never develop serious symptoms.

Mitral Regurgitation.

Mitral regurgitation is the commonest valvular defect of childhood, resulting from distortion, and consequent imperfect closure, of the mitral valve. Owing to the regurgitation of the blood into the left auricle, the same becomes hypertrophied, and later dilated; the pulmonary circulation becomes embarrassed, and an extra amount of work is thrown upon the right ventricle, which also becomes hypertrophied, to meet the extra strain brought upon its walls. The damming back of the blood in the pulmonary artery causes the accentuated second sound over the pulmonary valve, so characteristic of mitral regurgitation. The left ventricle eventually hypertrophies, in consequence of the increased pressure in the pulmonary artery, against which it must work in order to sustain the circulation. Urgent symptoms are the result of failing right heart, the right ventricle often dilating to a great degree, even to the production of incompetency of the tricuspid valve.

The physical signs of mitral regurgitation are: a systolic murmur heard with the greatest intensity at the apex,

and transmitted into the left axilla; accentuated second sound over the pulmonary artery; increased area of dullness to the right, indicating hypertrophy and dilatation of the right ventricle; displacement downward and outward of the apex.

Mitral Stenosis.

Mitral stenosis is usually associated with regurgitation, owing to a shrinkage of the valves and the auriculo-ventricular orifice, or obstruction resulting from fibrinous or calcareous deposits. It may, however, exist alone, and in such cases it is associated with subacute rheumatism and insidious endocarditis.

A pure case of mitral stenosis is marked by dyspnœa; small, feeble pulse; dilatation of the left auricle, and hypertrophy, with later dilatation of the right ventricle, the left ventricle not participating in the process. The physical signs are: a presystolic murmur, which may assume a purring character, perceptible to the touch; accentuated second sound over the pulmonary valve; area of dullness increased upward and to the right.

Aortic Stenosis.

Stenosis of the aortic orifice results from pronounced attacks of endocarditis, for which reason it is one of the rarer organic affections, and seldom seen alone, usually being associated with mitral regurgitation. From the nature of the lesions at the aortic orifice, regurgitation is also frequently added to the obstruction. Unless there is marked stenosis, symptoms are not prominent, as the hypertrophied left ventricle perfectly compensates for the defect. Complete recovery is possible.

The physical signs are: a systolic murmur heard over the aortic orifice, and transmitted into the carotids; displacement of the apex downward and outward, from hypertrophy of the left ventricle; slowing of the pulse.

Aortic Regurgitation.

Regurgitation at the aortic orifice is rare in children, and is never observed as a single condition. The commonest causes for aortic regurgitation, namely, sclerosis of the valves due to syphilis, gout and alcoholism, are practically never present in childhood, and for this reason it is only found with severe cases of endocarditis, especially the variety complicating the infectious fevers, from which stenosis and mitral disease also result.

As a result of the regurgitation of the blood into the left ventricle the same becomes markedly hypertrophied, later dilating with the consequent productions of mitral regurgitation.

The physical signs are a rapid, strong, full pulse, with sudden collapse (Corrigan's pulse); a diastolic murmur at the aortic orifice; extension of cardiac dullness in the direction of the heart's long axis and displacement of the apex-beat downward and outward; arched appearance in the region of the præcordium in young subjects; strong, bounding pulsation of the carotids.

Treatment.—The child's general condition must be carefully observed and physical overexertion strictly prohibited, in order to maintain as perfect a compensation as possible. Systematic exercise, with sufficient sleep and a highly nutritious, non-stimulating diet, and special attention to the digestive function, are the important considerations.

No form of treatment has as yet exceeded in expectations the results obtained by the Schott method of baths and resisted movements, and when given in conjunction with remedies which may be called for upon general or special indications, this line of treatment will, no doubt, prove itself without equal. The effect of the bath, as described by Dr. Edward R. Snader,* is "to reduce the size of a

* "The Bad Nauheim Treatment of Heart Disease," *Hahnemannian Monthly*, November, 1898.

dilated heart, diminish the number of pulse-beats, fill the arteries, partially empty the veins, open the cutaneous capillaries, and inaugurate a rehabilitation of a damaged heart-muscle by reason of nutritional changes." That this change takes place in the heart has not only been repeatedly demonstrated by the skillful use of percussion, but it has also been actually shown by means of skiagraphs, personally made by Dr. Theodor Schott.*

The advent of urgent symptoms as a result of ruptured compensation will at times require a purely physiological prescription to tide the case over into a condition in which the system will react to the indicated remedy. Pulmonary congestion due to overfilling of the right heart and general venous stagnation calls for *glonoin* (drop-doses of the second decimal dilution, repeated half hourly until relief is obtained), the action of which is well supplemented by *veratrum viride* 2x, given at less frequent intervals. A failing left ventricle is frequently rescued by the judicious use of *digitalis*, or, better, *strophanthus*, in five-drop doses of the tincture, repeated in from one to two hours until results are obtained. Under no circumstances, however, should such treatment be extended beyond the critical period. Rest, alcoholic stimulation and a carefully-chosen remedy must be relied upon to safely bring the patient back to a state of restored compensation.

Attacks of sudden heart failure call for rapid-acting stimulants, such as *ammonia*, the *alcoholics*, and *nitroglycerin*. The most positive results are obtained in these cases by the hypodermatic injection of *strychnia* (one one-hundredth to one-fiftieth of a grain).

Acon.—Attacks of anxiety, pallor, restlessness, tingling in the extremities, small, thready pulse, fear of death. Also hacking cough, with stitching pains and hæmoptysis accompanying valvular disease.

* "Medical Record," March 26, 1898.

Arsenicum.—Cardiac weakness with præcordial anguish and oppression; inability to lie down; nocturnal aggravation; anasarca of lower extremities. *Arsenicum iod.* embodies to a certain extent the properties of *arsenic* and *iodine*, both of which possess marked and characteristic cardiac symptoms in their pathogenesis.

Cactus grand.—*Cactus* is quite extensively used in the first decimal dilution and in the tincture, for its sustaining action upon the heart, being credited with the non-production of cumulative or harmful effects. It is a valuable remedy in mitral regurgitation with pains radiating down the left arm; also sense of constriction about the heart; small, feeble, intermittent pulse; icy-cold feet.

Convallaria.—Mitral stenosis, with dyspnœa and irregular heart action; dilatation of the right ventricle.

Digitalis.—Irregular, intermittent action of heart. During perfect rest the heart's action is slow, but the slightest exertion produces accelerated and irregular action. Sensation of complete arrest of heart's action.

Gelsemium is similar in some respects to *digitalis*. There is a feeling as if the heart would stop beating if he did not keep moving about; also prominently asynchronism of heart's action and cyanosis of the lips.

Iodium.—Violent palpitation from the slightest exertion. Shortness of breath, palpitation and feeling of weakness on going up-stairs; constant heavy, oppressive pain in the region of the heart.—(HERING.)

Lachesis.—Awakens from sleep with sense of suffocation in throat; cannot bear anything tight about throat; venous congestion of internal organs; dilated veinules on chest; defective peripheral circulation and tendency to cyanosis. *Lachesis* is one of the most useful and prompt-acting cardiac remedies in the materia medica.

Lithium carb.—Soreness about the heart, worse from stooping; pains in the heart before and at time of urinating; fluttering and trembling of heart; rheumatic diathesis.

Natrum mur.—Fluttering of the heart, with attacks of faintness; irregular and intermitting heart's action; anaemia; craving for salty food.

Phosphorus.—Tightness across the upper portion of the chest, with tight cough and spitting of blood; weakness of the right heart, with venous stagnation; palpitation from every emotion, with rush of blood to the chest in rapidly growing youth.

Rhus tox.—Rheumatic affections; hypertrophy from physical overexertion, with palpitation and pain shooting from region of heart down the left arm.

Spigelia.—Sharp, stitching pains in region of heart; anxiety and oppression when lying down; can only sleep on the right side; purring feeling over heart. Great dyspnœa at every change of position.

Spongia.—Attacks of oppression and cardiac pain when lying with head low; suddenly awaking after midnight, with suffocation, great alarm, anxiety.—(HERING.) Sensation as if he had to breathe through a dry sponge. Valvular insufficiency, pericarditis in stage of effusion and aneurism are within the scope of this remedy.

In the *dropsy* of heart disease I have obtained the best results from *apocynum cannabinum*, twenty drops of the decoction three times daily. Swelling of the ankles and other minor conditions, simply pointing to a weak heart and sluggish venous circulation, yield very satisfactorily to such remedies as *arsenicum*, *bryonia*, *kali carb.*, *lycopodium*, *blatta*, and others. Purgation may become necessary in pronounced cases, threatening the patient's life.

Functional Disorders.

As has already been pointed out, functional disorders of the heart are not very common during childhood. The most prominent causes of these disorders are gastro-intestinal irritation, helminthiasis, teething, anaemia, chorea and hysteria.

The *symptoms* are various, the commonest type of disorder being irregularity of rhythm and intermission; palpitation with rapid breathing and attacks of syncope being next in order. Heart consciousness is obviously less common in children than in adults, and angina pectoris is quite a rare disease.

A typical case of *angina pectoris* in a girl ten years old was recently brought to my clinic at the Children's Homœopathic Hospital. She was apparently in good health, having had no prior serious illness, and the family history was good, with the exception of rheumatism on the mother's side. There had been stitching pains in the heart for several weeks, and two weeks before she was seen the first paroxysm developed. The paroxysms then appeared at intervals of several days, beginning with a feeling of extreme tiredness and oppression about the heart, followed by sharp agonizing pains in the heart and pains radiating down both arms into the wrists, the left one becoming affected first. The face became flushed, the pulse small and rapid, and the heart's action violent. *Amyl nitrite* inhalations immediately controlled the paroxysms, and as she had three in succession at the hospital the diagnosis could be readily confirmed. Under the administration of *spigelia* 30 there was no further return of the trouble.

The *treatment* of functional heart affections is mainly hygienic, coupled with the administration of such remedies as *aconite*, *belladonna*, *cactus*, *digitalis*, *kalmia*, *nux vomica*, *pulsatilla*, *rhus tox.* and *spigelia*. The child's general condition must be looked after, and if helminthiasis, intestinal catarrh, lithæmia or any other exciting cause be discovered, treatment must at once be instituted in that direction:

CHAPTER XIII.

DISEASES OF THE KIDNEYS AND URINARY TRACT.

NEPHRITIS complicating the infectious fevers is the most frequent form of renal disease encountered during childhood, and is far more important from the clinical standpoint than the rare malformations, malpositions and neoplasms which seldom present symptoms arousing suspicion of their presence, and which belong entirely to the domain of surgery. Innocent fibromata, adenomata and cystic degenerations are occasionally met with, and outside of hæmaturia produce no characteristic symptoms, unless they attract attention by attaining considerable size. Malignant tumors are almost invariably sarcomata and have a tendency to grow very rapidly.

The normal kidney can occasionally be palpated in children with flabby abdominal walls and lax tissues, especially in the rachitic, the left kidney being the most accessible.

For a diagnosis of the affections appealing most directly to the medical practitioner the quantity and composition of the urine, together with the mode and frequency of micturition, must be considered. During infancy there is a relatively larger quantity of urine excreted than later in life. Standard figures cannot be given, but the amount gradually increases from an ounce or more in the first week of life to about twenty ounces at the completion of dentition, and thirty-six ounces just prior to puberty.

The frequency of urination depends upon the age, and, to a less extent, upon such modifying influences as sleep, temperament and habit. Concerning the control over micturition, Ulzmann* writes: "In the earliest childhood,

* "Genito-Urinary Neuroses."

urination and defecation take place without any subjective sensations. The slightest contraction of the bladder and of the rectum suffices to expel the urine and faeces, since the resistance of the sphincters is wanting. After the first year of life, children begin to voluntarily hold back the faeces, while the urine still flows involuntarily, often against the will of the little ones. The ability to hold the urine back at will is usually established at about the end of the second year; that is, after the first dentition."

The specific gravity is lower than in adults, and the urine contains a greater percentage of uric acid, but less urea and inorganic salts. It is usually clear, but may be turbid from the presence of mucus and white urates.

The method of collecting the urine for examination has been described in the chapter on "Clinical Examination."

Albuminuria.

Albuminuria not traceable to nephritis is encountered in two forms, namely, *idiopathic albuminuria* and *acute degeneration of the kidneys*. The former condition is also known as cyclic albuminuria, which, however, is a misnomer, as the appearance of albumin in these cases is the result of physical exertion. It is most frequently seen in male children who are anæmic or neurotic, and develops during adolescence. During complete rest in bed the albumin disappears, and it is seldom found in the morning urine.

Acute degeneration of the kidneys occurs during the infectious fevers, especially in scarlet fever, diphtheria, pneumonia and typhoid fever. Henoch has also repeatedly seen this condition in autopsies upon atrophic children, children dying from diseases characterized by marked loss of vital fluids, *e.g.*, cholera infantum, intestinal tuberculosis, etc., and after prolonged high temperature.

Certain poisons, like *arsenic* and *phosphorus*, and many drugs, notably *cantharis* and *turpentine*, act upon the renal epithelium during their elimination. The local as well as

the internal use of *bichloride of mercury* is frequently attended with albuminuria for a similar reason. Febrile albuminuria can, therefore, be the result either of a prolonged temperature, especially with depletion of the system, or of the direct action of an irritating toxine eliminated by the kidneys.

The kidney appears slightly swollen, and the cortical substance presents a grayish appearance, which may advance to fatty changes. Microscopically the epithelial cells of the tubules are the seat of cloudy swelling.

The *prognosis* is favorable in both conditions. In idiopathic albuminuria much can be done by constitutional treatment. The diet is of great importance, and frequently a restriction to farinaceous foods, fish, fruit and fats suffices to clear up the albuminuria, as demonstrated by Fothergill.* The same author considered many cases of albuminuria to be really nothing more than an escape of peptones from the kidneys. Where, however, the patient is poorly nourished, a tonic treatment must be instituted, together with the constitutional remedy. Febrile albuminuria clears up with the recovery from the disease which has induced it. Nitrogenous food must be withheld during its course, and in the absence of strong indications for another remedy, one of the following should be selected:

Apis, arsen., canth., merc. cor., phos., terebinth. For special indications, see Treatment of *Acute Nephritis*.

Acute Nephritis.

Pathologically two forms of acute nephritis are to be distinguished, according to the intensity and location of the inflammatory process. In the milder form there is congestion of the kidneys, with exudation of blood plasma and leucocytes, and degeneration of the epithelium of the urinary tubule and glomeruli. For this variety Delafield† has

* "Manual of Dietetics."

† Pepper, "Text-Book of Practice."

chosen the name *acute exudative nephritis*, while the more extensive inflammation, in which the stroma and glomeruli are involved in permanent pathological changes, he designates as *acute productive nephritis*. Here there is, beside the exudation, a growth of connective tissue in the stroma and a growth of the capsule cells of the Malpighian bodies.

Etiology.—The relation of the nephritis of childhood to infectious fevers is almost an inseparable link; indeed, cases not traceable to one of these fevers are looked upon as the result of an infection of unknown origin. The toxins of the pathogenic micro-organisms under consideration act directly upon the blood-vessels and epithelial cells of the kidneys, producing one of the following conditions according to the circumstances of the case: acute degeneration, acute exudation, nephritis, or acute productive nephritis.

The first-named condition is the primary result, and, if the irritation is not prolonged beyond a certain limit, it will be the only pathological change taking place. Acute degeneration, therefore, appears in the early stages of infectious fevers.

Should, however, the process be continued, or the exciting cause be quite energetic in action from the beginning, a true exudate inflammation will be the result. For this reason actual nephritis is usually a late occurrence in the course of the fever.

The productive type of nephritis is a more diffuse inflammation, more subacute in its type, and most frequently follows upon scarlet fever, as a result of the active kidney-poison peculiar to this disease.

Aside from the clearly infectious cases, nephritis has been traced to catching cold from exposure to draughts or living in cold, damp dwellings; the presence of bile-acids in the blood; diphtheria antitoxin injections,* and to the use of many well-known drugs.

* Vissman, "Med. Record," Sept. 14, 1895; Siegert, "Archiv. für Path. Anatomie," 1896.

Symptomatology.—Occurring early in the course of a severe infectious fever, the presence of albumin in the urine, together with a few hyaline or granular casts, indicates nothing beyond an acute degeneration of the kidneys. This may also occur during a prolonged high fever; but when a true nephritis develops there are added the symptoms of dropsy, scanty urine, increased fever, and the presence of renal epithelium, blood, leucocytes, hyaline and granular casts.

A primary nephritis is ushered in with high fever, pain in the region of the kidneys, headache and vomiting, scanty urine and dropsy.

When secondary to an infectious fever the symptoms develop less abruptly, usually during the height of the fever, and frequently a renal affection is not suspected until dropsy and scanty urine become prominent, or the protracted course of the disease leads to an examination of the urine, when the mystery becomes solved. Post-scarlatinal nephritis appears, as a rule, in the third or fourth week of the disease.

Dropsy is naturally most noticeable in those portions of the body possessed of loose areolar tissue, and for this reason the face, particularly the eyelids, the wrists and ankles, legs and scrotum, become most markedly affected. The pleural and peritoneal sacs are involved in grave cases.

Dilatation of the heart, indicated by an increase in the area of cardiac dullness and weak pulse, is a frequent complication arising during the course of the disease. The urine is diminished in quantity, the specific gravity high although the amount of solids excreted is far below the normal, its color is dark-red or smoky, the latter indicating the admixture of renal blood, and it contains albumin in abundance, blood, leucocytes, renal epithelium, and casts. Early there will be blood and narrow hyaline casts; later epithelial, granular and broader hyaline casts.

Prognosis.—The absence of complete suppression of urine and uræmia, the latter manifesting itself in severe headache and vomiting, followed by coma and general convulsions, and the speedy control of the anasarca, with absence of extensive pleural effusions and œdema of the glottis, offers a favorable prognosis as far as the acute condition is concerned.

Long-continuing anæmia and albuminuria will indicate interstitial and destructive changes in the kidney structure, but in view of the fact that the child's kidney possesses marked recuperative properties, permanent recovery can usually be obtained under extreme care in hygienic measures and the careful selection of remedies.

Our therapeutic resources are particularly rich in renal affections, both for the acute as well as more permanent changes taking place in the kidney, and the results of careful individualizing are most gratifying.

Treatment.—As most of the cases develop during one of the infectious fevers, prophylactic measures stand high in the therapy of nephritis. They must aim to save the kidneys as much as possible from any extra amount of work and from the danger attending congestion of these organs, the practice of which resolves itself into the elimination of highly-nitrogenized foods from the dietary; a maintenance of the normal cutaneous function, or even a stimulation of the same; rest in bed and protection against chilling influences. Especially in scarlet fever does it become imperative to keep the child in bed for from three to six weeks, according to the severity of the case, and return most cautiously to a diet of solid food.

The free use of boiled water and the daily warm bath to induce gentle sweating under a woolen blanket is a great aid to the kidneys, and frequently all-sufficient to overcome moderate anasarca. Suppression of urine and uræmic manifestations call for the hot pack. Goodno* recom-

* "Practice of Medicine."

mends the hot-air bath in these cases. The diet should consist mainly of milk, and in no case should meat, eggs or strong broths be administered. Cereals and stewed fruit may be selected as solid food is gradually resumed. The bowels must be kept freely open by the use of enemata, the water being in many instances absorbed to a large extent, and producing a marked increase in the flow of urine.

Owing to the fact that the nephritis is usually secondary to another condition, our indications for a remedy are not so sharply defined as in the primary form of adults; for which reason the *aconite* and *belladonna* stage is frequently overlooked, and we must at once turn to such remedies as *arsen.*, *apis*, *cantharis*, *hepar*, *lachesis*, *merc. cor.*, *rhus tox.* and *terebinthina*.

Arsenicum is indicated by the great anæmia and anasarca, especially prominent about the eyelids in the morning. There is scanty urine, the characteristic thirst and restlessness, and cardiac involvement.

Apis is frequently called for, and is most useful for conditions which arise suddenly, especially during the course of some other disease; the urine becomes scanty or suppressed, general dropsy develops, and œdema of the glottis may threaten; cerebral involvement, with coma, shrill, piercing cry, and convulsions.

Cantharis is highly lauded by both schools of medicine. It is useful for the very acute symptoms which may arise, such as high fever, tearing pains in the kidneys, vesical tenesmus, retention of urine and uræmic coma; also in the later stages, to remove the albumin from the urine.

Hepar.—Urine decreased in quantity and containing blood, albumin and hyaline casts. Kafka's experience was: "No remedy will act quicker or surer than *hepar sulph.* 3 in the case of dropsy and albuminuria occurring during scarlet fever."* Although his reason for using this remedy was on

* "Homœopatische Therapie."

strictly pathological grounds—*i.e.*, the relationship of *hepar* to croupous inflammation—there are many subjective symptoms prominent in the pathogenesis of *hepar* which will lead us to an accurate application of the drug in these cases.

Lachesis and *terebinthina*, especially the latter in post-scarlatinal nephritis, are the remedies *par excellence* for hæmorrhagic nephritis. In *lachesis* the urine is very dark in color, and the characteristic subjective symptoms of the drug are present. The urine indicating *terebinth.* is highly albuminous and scanty, the color being “smoky,” due to the abundant admixture of blood. *Helleb.* is also prominent in hæmaturia.

Uræmic convulsions call for *cicuta*, *bell.*, *hyos.* or *stramonium*; the *arsenite of copper* seems particularly applicable to all forms of uræmic conditions.

All complications, such as serous effusions, œdema of the lungs, etc., must be dealt with purely symptomatically. The resulting anæmia most frequently calls for *arsen.*, *kali carb.*, *phosphorus* and *pulsatilla*.

Chronic Nephritis ; Bright’s Disease.

A chronic nephritis may develop as the outcome of former acute conditions. Especially can this be said of post-scarlatinal productive nephritis; but more commonly it complicates other important disturbances, prominently general tuberculosis, tuberculous caries, long-continued suppurative processes and hereditary syphilis.

Both pathologically and clinically chronic nephritis can be recognized in two distinct forms, namely, chronic parenchymatous and chronic interstitial nephritis.

Chronic Parenchymatous Nephritis.

In this form the kidney becomes much enlarged, presenting a yellowish-white appearance. On section, the cortex will be found thickened and swollen and light in color, while the pyramids retain their dark-red hue.

The epithelium of the tubules is swollen and degenerated: the tubules contain degenerated cells and coagulated fibrin. Hyperplasia of the interstitial connective tissue and nuclear proliferation in the glomeruli and their capillaries, together with amyloid degeneration of the smaller vessels, are the historical lesions.

Symptomatology.—As a rule, the first symptom which will give any evidence of a renal disturbance, outside of an accidental discovery of albumin and casts in the urine, will be dropsy. The history of a former attack of acute nephritis, especially when the child is markedly anæmic and passing an insufficient quantity of urine, should, however, lead to a suspicion of Bright's disease long before the more serious symptoms make their appearance.

Anasarca usually develops suddenly, although the bagginess of the eyelids, especially in the morning, may for some time be the only manifestation. When marked, the child may become literally swollen from head to foot; with this the urine is very scanty, or even suppressed.

With the progress of the disease the quantity of urine decreases and becomes turbid from the presence of inflammatory products, urates, and sometimes blood. Albumin is found abundantly, and a microscopic examination reveals degenerated epithelium, hyaline, granular, epithelial, and at times fatty casts. The specific gravity is below normal.

The *course* of the disease may extend over years; and although much more can be done for children than for adults, especially in the uncomplicated variety, still the condition is always serious, and must be looked upon as a constant menace to the child's life, particularly in the advent of some acute illness.

During its course there is anæmia, lassitude, indigestion, headache, and kindred nervous disturbances. Dropsical effusions into the pleura or pericardium may take place.

Uræmia is usually ushered in by severe headache and vomiting, followed by convulsions and coma. In children

convulsions are more common than in adults, for obvious reasons. Uræmia is not so liable to develop when the amyloid changes are marked in the kidneys, which can be suspected from the freer urinary secretion and the coexisting enlarged liver and diarrhœa.

Chronic Interstitial Nephritis.

This is a rare form of nephritis in children, and its etiology is not well understood. Syphilis, tuberculosis, acute alcoholism and arterio-sclerosis have been considered as causes, and in some instances it has apparently followed in the wake of an acute infectious or eruptive fever. Guthrie has lately reported seven cases in the "Lancet." He considers it not a product of parenchymatous atrophy, but an interstitial inflammatory process with round-cell infiltration of the stroma of the kidney, beginning in the cortex and spreading in the form of bands to the centre of the organ.

The urine is pale and abundant, low in specific gravity, and containing a small percentage of albumin, which may only be present at certain times. Such an albuminuria occurring several years after an infectious disease, the albumin being especially found in the morning urine, together with hyaline and granular casts, is a strong evidence of interstitial nephritis.

Dropsy seldom develops, but persistent gastro-intestinal symptoms and certain nervous disturbances, such as periodic headaches, vertigo, and even convulsions, together with high arterial tension and hypertrophy of the heart, will indicate contracted kidney, even in the absence of albumin. The *prognosis* depends much upon the stability of the circulatory system, and the course is a longer one than in parenchymatous nephritis. Uræmia or a fatal hæmorrhage into the brain or other organ of the body usually terminates the disease.

Treatment.—The diet should be restricted in nitrogenous food—not, however, absolutely so, especially when

there is great exhaustion and anæmia; its administration must, however, be carefully watched and entirely forbidden when uræmic symptoms threaten. Milk is the ideal food for these cases; it should hold the most prominent place in the dietary, and it can be modified in many ways to vary the monotony of its administration. Fresh vegetables, fruit and cereals, and vegetable soups made with a shin-bone stripped of the meat, or young chicken, are all allowable.

The function of the skin must be promoted and the cutaneous circulation stimulated by the morning sponge-bath, followed by vigorous rubbing. The undergarments must be of wool, to protect against any sudden chilling.

Water must be drunk faithfully; such springs as Poland, Bedford and Waukesha, or a distilled water, being especially beneficial in keeping up a sufficient excretion of urinary solids.

The measures recommended for dropsy and uræmia under *acute nephritis* are equally applicable here. The remedies most useful for the nephritis itself are *apis*, *arsenicum*, *aurum mur.*, *canth.*, *merc. cor.*, *phos.* and *plumbum*. These remedies are strictly homœopathic to the pathological process in the kidney, and have proven themselves of great clinical value. *Aurum* and *plumbum* are particularly related to the interstitial form of nephritis.

If, in spite of the well-selected remedy, dropsy remains unimproved and the flow of urine dangerously scanty, nothing will act more favorably than *apocynum cannab.* given in 10 to 15 minim doses of the decoction (Boericke & Tafel's) in a tablespoonful of water. The action of this remedy is prompt, and I have never seen bad results from its use.

The attacks of high arterial tension occurring in interstitial nephritis are controlled by *glonoin*, one minim of the second decimal dilution, repeated half-hourly.

Veratrum viride 2x will keep up the favorable action of

the *glonoin*, and should be substituted for the latter as soon as the urgent symptoms have been controlled.

The nephritis consequent to chronic suppuration, vertebral caries, etc., will call for ASAF., AURUM, *calc. phos.*, *china*, *ferrum*, HEPAR, *iodoform*, *mezer.*, PHOS., PHOS. AC., *sil.*, SULPH.

Diabetes Insipidus.

Diabetes insipidus is more frequently encountered during childhood than saccharine diabetes, but both are rare diseases. Of the cases reported in literature about 20 per cent. have occurred in children under ten years.

The *etiology* and *pathology* are obscure; heredity, traumatism to the nervous system and organic brain disease, however, seem to bear distinct relationship to some cases, and it has occasionally developed after the infectious fevers.

The pathognomonic *symptoms* are polyuria and great thirst; the urine is pale and limpid, of low specific gravity, and contains neither sugar nor albumin. With this there are symptoms of impaired digestion, constipation and functional nervous disturbances. The onset is usually gradual and the course a prolonged and tedious one, either ending in recovery or in death from exhaustion or some intercurrent affection. The *prognosis* is not altogether unfavorable, especially in the young.

Differential diagnosis rests between *diabetes mellitus* and *interstitial nephritis*. From the former it is readily distinguished by the low specific gravity of the urine, the absence of sugar, as well as lack of marked and rapid emaciation. *Interstitial nephritis* is associated with arterio-sclerosis, hypertrophy of the heart and characteristic nervous phenomena, and repeated careful examinations of the urine seldom fail to find albumin and hyaline casts. *Hysterical polyuria* is emotional in origin and only a temporary disturbance.

The remedy which has yielded the most satisfactory results in my hands in cases of persistent polyuria, when the patient has been obliged to urinate freely every two hours,

or even more frequently, during the day, and four to six times during the night, the urine being pale and limpid, is *natrum muriaticum*, in moderately high dilution (from the 6th to 30th potency). Thirst may be a prominent symptom, together with constipation, etc.

Ignatia is occasionally useful in highly nervous temperaments. Goodno has obtained positive results from *strophanthus* 1x. Hughes recommends *scilla* 2x; Schuessler, *ferrum phos.* Every case will, however, require individual study, from the standpoint of the constitution, temperament and general disturbances.

Diabetes Mellitus.

True diabetes is very rare during childhood, and its pathology, etiology and symptomatology need no special mention here, as it is identical with the same condition in adults. The course, however, is more rapid, and it is considered very fatal. The disease may terminate in a few months with diabetic coma; or if it is a mild case, yielding to treatment, it may run for years.

The pathognomonic *symptoms* of diabetes mellitus are polyuria, voracious appetite and great thirst, with usually constipation and indigestion, marked and rapid emaciation, dryness of the skin and nervous disturbances, such as formication and neuralgia. The urine contains glucose, and its specific gravity is high. The differential diagnosis has been mentioned under *diabetes insipidus*.

Treatment.—The first step in the treatment must naturally be the selection of a suitable diet. The majority of clinicians adhere to the diabetic diet, although quite a number recommend a more liberal mode of feeding. No doubt there are cases which thrive just as well, or even better, on a liberal diet, but personal observation leads me to believe that they are rather the exception than the rule. Goodno recommends the employment of a diet absolutely free from carbohydrates until the glucose disappears from

the urine, then gradually increasing the dietary and noting the effect of each new article upon the urine. This is perhaps the most rational way of feeding diabetes, as this method withholds nothing excepting what an accurate observation has shown to be injurious to the patient.

Meat, fish, eggs, vegetables not containing much starch, fats and oils, gluten bread and milk should constitute the diet list as far as possible. Water should be administered freely. The very best water for these cases is Allouez, from Green Bay, Wisconsin. The results from its employment are most gratifying, and Clifford Mitchell* reports several remarkable cures from the use of this spring alone.

Arsen.—Great emaciation and exhaustion; anæmia; intense thirst; associated nephritis; complications, such as boils, gangrene, cutaneous eruptions.

Aurum.—Syphilitic dyscrasia; profound neurasthenia and mental depression.

Helonias.—Great weakness, with pain and lame feeling in back; numbness and formication in legs and feet; dejected mood.

Lachesis.—Development of carbuncles during the disease; last stages.

Lactic acid.—Gastric disturbances predominate (*uranium nitr.*); dryness of tongue; empty feeling in epigastrium; constipation; stools hard and black; sluggish circulation in extremities. Administered in the lower dilutions.

Lyc.—This remedy is often indicated by its gastric symptoms, together with the presence of uric acid in the urine (*plumbum*). Pulmonary phthisis with hectic fever.

Nux vom.—When the digestive tract is the main seat of disturbance; also neuropathic cases with many characteristic nervous phenomena, such as formication in the limbs; irritability; numbness and parietic condition of the lower extremities; gouty inheritance.

* "A Contribution to the Therapeutics of Diabetes Mellitus," Hahnemannian Monthly, January, 1897.

Nux and *phosphoric acid* are perhaps the most frequently helpful remedies.

Phos. ac.—Cases of nervous origin. Profuse urination, with pain in back and region of kidneys, accompanied by great prostration, emaciation and sleeplessness. Rapid-growing youths.

Uranium nitr.—According to Prout, this remedy is especially useful when the disease originates in disturbances of the digestive tract, in contradistinction to *phosphoric acid*, which is indicated when it originates in the nervous system.

Rhus aromatica is a favorite remedy with the eclectic school, and it certainly has a marked control over the elimination of sugar through the urine. It is particularly indicated when there is dribbling or incontinence of urine, being administered in doses of several drops of the tincture, three to four times daily.

Many other remedies may be called for through their characteristic symptoms or on special indications, but the above list represents our sheet-anchors in this disease.

Renal Calculi.

The uric-acid diathesis is responsible for the majority of cases of calculi in children. These calculi are usually small and passed as gravel, inducing the characteristic pains known as *renal colic*. If not passed with the urine, they become the nucleus for a vesical calculus. Other varieties of calculi, less frequent, however, than the uric-acid concretions, are those composed of oxalate of lime, carbonate of lime and cystin. Phosphatic concretions are rare during childhood, as they result from inflammatory conditions of the urinary tract, while the others are primarily found in the urine.

According to Cadge, the prevalence of renal stone in children is due to improper diet and an insufficient quantity of milk, prevailing particularly when solid or artificial

foods are administered in excess.* Heredity and prolonged febrile disturbances seem also to have a strong relationship to the etiology. The majority of cases have been met with among the poorer classes.†

Symptomatology.—The presence of gravel in the urine may be the only sign of any disturbance, unless pain becomes a prominent symptom. The child may cry every time it urinates, and inspection will reveal uric-acid crystals and irritation of the urethra. “Occasionally, no doubt, there are renal colics quite unrecognizable in our young patients, although the urine may guide the treatment if charged with uric acid or mixed with blood.”‡ At times, however, the typical symptoms as found in adults will be present.

The symptoms due to the presence of uric acid in the blood are chiefly referable to the nervous system and digestive tract, making the little patient precocious, irritable and neurasthenic. Headache and insomnia are common disturbances. The digestive process is retarded, and catarrhal inflammations in various portions of the alimentary and respiratory tract frequently develop.

Treatment.—In the treatment of the diathesis the diet is of the greatest importance. Starchy foods, sugar and red meats are to be avoided, encouraging the free use of milk, green vegetables and fruit. Poultry, fish and eggs may be allowed sparingly. Water should be drunk freely between meals, and sufficient exercise, together with plenty of sleep, must be obtained.

For the constitutional condition, one of the following remedies will usually be indicated:

Berberis.—Yellow turbid urine, mushy sediment.

China.—Urine is pale, becoming turbid on standing, with yellowish flocculent sediment, or scanty urine with brick-dust deposit.

* Carleton, “Diseases of the Kidneys and Ureters.”

† Sir Henry Thompson.

‡ Finlayson, “Keating’s Cyclopædia.”

Lycopodium.—Brick-dust deposit in urine. It is scanty, high-colored, and stains the diaper a deep yellow. Whenever the child urinates it cries from the burning and smarting produced by the irritating urine.

Nux vom.—Gastric symptoms; constipation; insufficient exercise and sleep; gouty inheritance; painful urging to urinate; pain in right kidney, worse lying on the affected side; reddish urine.

Natr. mur.—Profuse and frequent urination. The urine is pale, and deposits a brick-dust sediment. Constipation; emaciation; anæmia.

Sepia.—Urine offensive, with greasy pellicle, leaving a pink, paint-like deposit in vessel.

Sulphur.—This remedy is frequently indicated by its general characteristics.

For the painful symptoms, one of these remedies should be considered: *Arg. nitr.*, *acon.*, *arsen.*, *bell.*, *berb. vulg.*, *canth.*, *dioscorea*, *lyc.*, *nux vom.*, *pareira brava*, *tabacum*, *uva ursi*. The inhalation of an anæsthetic or the administration of a narcotic is justifiable in the presence of uncontrollable, excruciating pain.

Berberis.—"I wish to sing the praises of *berberis* as a general remedy for pains centering in the region of the kidneys, radiating thence in every direction, especially down the ureters."—(WM. BOERICKE.*)

Enuresis.

Enuresis cannot be said to exist as a pathological condition until after the second year, for the child does not learn to voluntarily hold back the urine until after the first dentition period. A lack of physiological development of the sphincter vesicæ or an excessive irritability of the bladder are the essential features of this neurosis, although reflex irritation frequently seems capable of inducing enu-

* "Pain and its Homœopathic Treatment," North. Amer. Jour. of Hom., May, 1893.

resis in many instances. In the majority of cases, however, both of these conditions are operative, and, accordingly, both must be corrected before a cure can be established.

Enuresis exists primarily in children who are anæmic, neurasthenic or otherwise poorly nourished, and especially in nervous temperaments, the precocious being perhaps most afflicted, although the idiotic are late in learning to control micturition. Symptomatically it may occur in almost any organic nervous disease, particularly in epilepsy, where nocturnal enuresis is often the earliest symptom attracting attention, the convulsive seizure having been overlooked.

A highly-acid urine, cystitis and vesical calculus are also prominent causes of this affection.

Among the reflex disturbances capable of exciting enuresis must be considered phimosis, adherent prepuce and clitoris, abnormally small meatus, adenoid vegetations, rectal fissures and polypi, seat-worms.

Habit must not be forgotten as often playing a prominent rôle.

Symptomatology.—Wetting the bed is the most frequent form of enuresis, but in many instances the child is unable to control the urine during the day as well as night. Rarely is it purely diurnal. There is no dribbling, but the mere thought of urinating induces contraction of the walls of the bladder, the force of which the sphincter is unable to overcome. During the night a dream may suggest the idea of urinating, with consequent wetting of the bed, or the act may occur purely reflexly.

Enuresis is either promptly controlled by treatment or runs its course until puberty, but this is seldom the case under careful prescribing and correction of the patient's general condition.

Treatment.—Although a very stubborn affection in the majority of cases, enuresis often yields with astonishing

rapidity to the well-selected remedy. Anatomical defects must be corrected by the proper surgical means, and lithæmia, seat-worms, rectal fissures, etc., must receive their just share of attention before the enuresis can be properly treated. From the various specifics so highly praised I have not obtained uniform results; they, too, must suit the case in every respect, as well as any other remedy, in order to be curative.

Acon.—Recommended in cases of neurotic origin; child awakens from sleep in fright; *feverishness, due to seat-worms.*

Bell.—This is the allopathic remedy, usually employed in the form of *atropine*. When indicated by its characteristic nervous symptoms it frequently relieves in potency.

Benzoic acid.—Strong, penetrating urine. *Nitric acid* is very similar, although the urine is more ammoniacal, irritating, and the diathesis is syphilitic rather than rheumatic, as in *benzoic acid*.

Caust.—Enuresis during first sleep; atony of the sphincter vesicæ.

Cina.—Helminthiasis.

Equisetum.—This remedy has quite a reputation in enuresis, being employed in drop-doses of the tincture. It seems to control the habit very satisfactorily in many instances.

Ignatia.—*Ignatia* has given me the best results in those nervous, irritable children who are precocious and neurasthenic, and in whom the condition is due to a hyperæsthesia of the urethra. This can be demonstrated by the passage of a sound, which induces intense burning pain all out of proportion to the usual discomfort accompanying this operation. Curative results were obtained by the use of *ignatia* alone, although passing cold steel sounds is considered highly beneficial, especially in young boys who masturbate.—(POWERS.*) For the prostatic irritation induced by

* "Surgical Diseases of Children."

this vicious habit there is no more useful remedy than *staphisagria*.

Ferrum and *ferrum phos.* have proven beneficial in anæmic children; they are recommended for the diurnal variety.

Sulphur.—"The remedy which, among all others, has given me the quickest results is, without any doubt, *sulphur*, no matter if the children were blond or brunette, fat or thin, etc."—(JAHR.*) He recommends this remedy to be given first in every case in the absence of strong indications for another. In my hands it has only been of service when the typical sulphur constitution was present, but it is, no doubt, one of our most valuable remedies in enuresis.

Beside these remedies are not to be forgotten the *calcareas*, *lyc.*, *puls.*; *sepia* and *thuja*, constitutional and temperamental peculiarities being the chief indications for their selection.

* "Therapeutischer Leitfaden."

CHAPTER XIV.

DISEASES OF THE SKIN.

THE writer at the outset wishes it to be understood that the following articles are not intended to cover all of the cutaneous diseases of infants and children. An attempt has been made simply to speak concisely of the commoner varieties met with in practice.

The treatment herein described has proven efficacious from a clinical standpoint. In all instances the cause of disease, if possible, must be removed. Diseases due entirely to local agents and those responsible for their presence to parasites rarely demand anything but local treatment, while those dependent upon a constitutional or psoric taint must be eradicated by the administration of the well-selected homœopathic remedy.

Inflammations: Eczema ; Tetters.

Definition.—Eczema is an inflammatory, acute or chronic non-contagious disease of the skin, in the beginning presenting erythema, papules, vesicles or pustules, often in combination, associated with a varying degree of infiltration, burning and itching, and ending in serous or puriform degeneration by the formation of scales and crusts.

Symptomatology.—Any or all varieties of eczema may be present in infancy and childhood. *Eczema erythematosum* appears primarily as a reddened, mottled condition, without exudation. Later the involved surfaces may become excoriated and throw off a few scales of epidermis. In children it is seen most frequently about the genitals, the buttocks, and between the thighs.

Eczema papulosum.—This variety presents papules of varying size, surrounded by an erythematous or empurpled base and surmounted by a layer of thin scales. From incessant scratching the summit of these lesions becomes abraded and excretes a sticky serum, producing an eczema vesiculosum. The trunk and flexor surfaces of the limb are usually involved. This variety is slow to respond to treatment.

Eczema vesiculosum.—Vesicles, usually minute, characterize this type. Their apices are filled with a yellowish, sticky fluid. In most cases they rupture and coalesce, forming crusts. The lesions are usually situated upon the face, neck and scalp, and are attended with severe burning and itching. The vesicular variety is common to infants.

Eczema pustulosum.—In some cases, either because of a peculiarly favorable soil or by reason of the intensity of the inflammatory process, pustules rapidly develop upon a group of papulo-vesicular lesions. Indeed, it is not uncommon to find a lesion commencing as an erythema and running through all of the stages to pus formation. Eczema pustulosum usually results from a distinct pyogenic infection, traceable to scratching with dirty finger-nails. *Eczema rubrum* is not a distinct variety. It is a name applied to a condition presenting a complexity of symptoms, including erythema, papules, vesicles, pustules and scales. The parts involved are reddened, infiltrated, excoriated, and frequently covered with crusts. It is usually found about the bends of joints, and is attended with marked discomfort.

Eczema squamosum.—This is a chronic variety, and usually results from an attack of erythematous or papular eczema. Typical cases show thickened and infiltrated areas, situated upon the face and back of the neck. Sometimes the lesions are widely scattered.

Etiology.—Of late, dermatologists have attempted to establish the parasitic theory of eczema, but have failed because of inability to discover a specific micro-organism. Scabies

and pediculosis are often responsible for an eczema, the condition resulting from the irritation and scratching these parasites induce. The disease in infants may be traced directly to the action of local causes; particularly is this true with the newly-born, who are subjected to vigorous baths and energetically anointed with irritating lard and afterwards tightly enveloped in woolen garments—procedures likely to irritate a tender and delicate skin. The irritating discharges accompanying the diarrhœa of infancy frequently produce a local dermatitis, which is quickly converted into a weeping eczema. A tight or elongated foreskin and catarrhal inflammation of the vulvo-vaginal glands are frequently responsible for eczema in these parts. The too liberal application of water, the use of impure soaps and toilet articles, tight and heavy clothing, may provoke an attack. Vaccination plays a rôle in the causation of eczema. The writer recalls several cases directly traceable to it. From a clinical standpoint, dentition and eczema seem to be closely related; and, although it is difficult to understand this, yet attacks are aggravated by the eruption of a tooth, subside shortly afterwards, and occur upon the eruption of others. Occasionally too liberal indulgence in sweets will excite an attack. The fundamental cause of eczema of infants and children may be traced to a constitutional diathesis, usually hereditary, sometimes acquired. Eczematous parents often beget eczematous children. Although eczema occurs among the children of the rich, it is seen most frequently amongst the poor and illy-nourished, particularly amongst light-haired children, who show a tendency toward catarrhal affections of the upper air-passages. Eczema is occasionally associated with impetigo contagiosa and some of the other pustular dermatoses; it may follow scarlatina and varicella.

An attack may assume an acute, subacute or chronic form, although many cases are recognized as subacute conditions. A varying degree of burning and tingling accom-

panies all phases of the disease. Acute eczema infantile is accompanied by moderate fever; the skin of the affected region assumes a reddened hue, later attended by catarrhal exudation. Itching and burning are prominent symptoms. Acute eczema infantile usually commences upon the scalp, a favorable soil being furnished by the sebaceous secretions of this region. This, together with the gummy contents of the vesicles, mix and form dirty, grayish-yellowish crusts.

The odor is disgusting. Where parasiticism is present, it is hard to imagine a more repulsive picture. In advanced cases the glands about the ears and neck become involved, and not infrequently suppurate. Furunculosis of the scalp, face and neck is by no means a rare complication. Itching, scratching and inflammation reduce the sufferer to a condition decidedly grave.

In scrofulous children a pustular condition of the eyebrows results in subsequent crusting and destruction of the hair-follicles; frequently catarrhal conjunctivitis is present. The mucous membrane of the nose becomes involved. At first a thin, watery, later a thick, purulent discharge occurs, which forms pustules about the lips and angles of the mouth, resembling very much the lesions of impetigo contagiosa. Eczema genitalium frequently complicates the condition, presenting an erythematous variety, which may assume a vesicular form and invade the spaces between the thighs. The perinæum, anus, penis, scrotum and labia may become affected. Under such circumstances the parts assume a scarlet hue, becoming swollen, infiltrated and raw; vesicles predominate.

The chronic eczemas of infancy and childhood are confined mostly to the scalp, face, and naso-labial furrows, rarely to the prepuce and anus. A chronic eczema capitis is usually confined to a small area about the occiput. Here papulo-squamous lesions predominate; sometimes a pustular type is found, for which paraciticism is largely responsible. Chronic eczema of the nose and angles of the mouth pre-

sent fissures, crusts and shallow ulcers. A similar condition is seen in chronic eczemas about the genitals and anus.

Pathology and Morbid Anatomy.—In acute eczema the pathological changes may be diffuse or circumscribed. They are primarily situated in the papillary portion of the derma, although they may later descend as deep as the fatty layer. They consist of congestion of the blood and lymph vessels, causing a serous exudate, which gives rise to infiltration and induration of the skin. This exudate may destroy the rete cells; the formation of vesicles or bullæ may be entirely absent, and the exudative inflammation result only in the destruction of the epidermis. In chronic eczema the inflammatory changes are most marked about the blood-vessels in the derma; the papillæ become hypertrophied; proliferation of connective-tissue cells takes place; the subcutaneous tissues may become infiltrated and thickening result.

Diagnosis.—Certain characteristic symptoms are invariably present in eczema; burning and itching are peculiar to eczematous eruptions, and the skin is usually infiltrated. Some discharge may usually be seen; it may be colorless or stain the clothing. Since eczema simulates so many diseases of the skin, it will be necessary to point out a few diseases for which it may be mistaken.

Erysipelas is an acute inflammation, involving the deeper layers of the skin. It commences from a single focus and spreads rapidly, while eczema starts from a larger area. There is more fever in erysipelas, and, as a rule, very little, if any, discharge.

Psoriasis is rarely seen in infants and very young children. A psoriatic condition of the scalp may suggest a squamous eczema of that region. The patch of psoriasis, however, is sharply defined, and the scales are abundant, large and silvery. Psoriasis is always dry, while eczema usually presents some degree of moisture. Psoriasis selects the extensor and eczema the flexor surfaces of the limbs.

Urticaria may be mistaken for a papular eczema, but the lesions of urticaria are wheals; the disease usually follows acute indigestion, and is of short duration.

Lichen ruber planus.—Papular eczema presents certain features peculiar to lichen ruber planus; both eruptions itch; both present papules. The lichen papule, however, runs a chronic course, does not change its identity, and always leaves a certain amount of pigmentation behind.

Syphilis.—In most cases a definite history of chancre, or usually extra-genital inherited syphilis, will throw light upon the diagnosis. In chronic relapsing syphilides, for instance, the circinate papular syphiloderm, the diagnosis is not always easily made.

The papules of syphilis do not itch and are usually grouped. An eczema of the scalp may resemble syphilis of that region, particularly where the lesions are of a pustular character. The syphilitic process, however, is more extensive; the disease makes inroads upon the scalp and ulceration is somewhat extensive; rupial crusts are usually present.

The points of resemblance which *impetigo contagiosa*, *pediculosis capitis* and *scabies* bear to eczema are pointed out under these special subjects.

Prognosis.—The course of an eczema depends upon so many circumstances that it is difficult to accurately foretell its outcome. As a rule, it runs a chronic course—age, the location affected, the exciting causes, heredity and constitutional predisposition are factors which must be considered. In the majority of cases the existing eruption can be controlled. Proper hygienic surroundings and cleanliness will cure many of the simpler types, while those dependent on a scrofulous taint are exceedingly rebellious to treatment. Acute eczema capitis, if uncomplicated by paraciticism, may, by proper treatment, be quickly controlled. Eczema of the nose is slow to respond to treatment. The

This should be applied to the parts several times daily. It is particularly serviceable in controlling the itching. Where the genitals become affected, *subnitrate of bismuth*, alone or combined with *starch*, *talcum* or *lycopodium powder*, may be applied with beneficial results.

The parts should not be bathed in water, but should be mopped with a soft woollen rag and bathed with pure olive oil. After this, any of the above powders may be used, and a thin layer of linen placed between the thighs. The internal remedies best suited for such cases are *aconite*, *belladonna* and *nux vomica*. *Pulsatilla* should be given to those cases affected by gastric derangement.

Vesicular eczema is usually found as a subacute or chronic condition. Frequently pediculi are present, especially when the scalp is invaded, and they should receive the remedy already suggested for their extermination. Scales and crusts may be removed by soaking thoroughly in olive oil or by applying a milk poultice. These must be thoroughly removed before a cure may be hoped for; after which, any astringent powder may be applied. Intense itching is very frequently controlled by the use of a very weak solution of carbolic acid, five drops to the half-ounce of water. Internally a remedy of most positive value in the acute vesicular stage is *rhus tox.*; its provings show a vesicular eruption, attended with itching, burning and tingling.

The pustular stage demands *hepar*; later, when the pustules rupture and throw out a thick yellow fluid, which quickly dries and forms crusts, *graphites* will be needed; and occasionally, where these symptoms are present and the glands of the neck become involved, *sulphur* may be advantageously employed. Frequently, in marasmatic children, acute eczema capitis assumes a chronic type; the lesions are squamous, surrounded by an inflammatory base; the hair is dry, lustreless and brittle; the scalp bleeds easily; here *sulphur* and *arsenicum* meet the condition;

while *calcarca carbonica* is indicated in pale, flat, flabby and pot-bellied children. Occasionally local remedies are of value, but not nearly as much so as in the acute variety. The cause here is constitutional, and the psoric taint must be eradicated. Locally, only stimulants are required.

Ichthyol of vaselin, twenty-five grains to the ounce, is very effective.

Acute vesicular eczema of the face calls for *rhus tox.*; *apis* is indicated if much œdema and erythema are present; *graphites*, where the condition becomes chronic. Locally I have obtained beneficial results from *ichthyol*; and although this is a stimulant, yet in acute eczema of the face and of other parts not covered by hairs it acts magically. I apply it in the form of a 25-per cent. aqueous solution. If too irritating or not sufficiently therapeutic in its action, the strength may be increased or diminished. Occasionally a dusting-powder of calomel is of advantage.

Eczema of the eyes and the border of the lids should be treated by washing with a saturated solution of boric acid. This dissolves the crusts, and is beneficial to the accompanying conjunctivitis. This variety occurs in badly-nourished scrofulous children, and calls for the employment of the following remedies: *graphites*, *sulphur*, *calcareo* or *psorinum*.

Eczema of the nose can frequently only be cured by directing treatment to its causative factor—a chronic purulent rhinitis; crusts may be dissolved by a weak solution of hydrogen peroxid. Eczema of the angles of the mouth is mostly chronic, the folds are cracked and fissured, and bleed easily. These may be stimulated by applying a weak solution of nitrate of silver, five grains to the ounce. Internally, *graphites* is indicated.

One of the most obstinate forms in infants is eczema of the genitals and surrounding structures; it may assume any clinical variety. It is usually acute, but may be chronic. The surface is raw, and usually exudes a sticky

fluid; the genitals become swollen. The inflammation is best combated by the application of an astringent powder, after which the parts are fixed in a well-fitting sterilized gauze bandage. Itching is thus controlled. Internally, *aconite*, *arnica*, *bryonia*, *rhus tox.* and *graphites* are indicated. The subacute types demand a recognition of their cause and prompt removal; in some cases a long foreskin, by causing frequent urination, may cause an eczema. Here, after the control of the acute symptoms, circumcision is demanded. In most cases it must be remembered that diet and hygiene will do much toward a cure. Eczema, however, is due largely to the existence of a psoric taint, which can only be successfully eradicated by the administration of a well-selected internal remedy.

Erythema.

Erythema may be defined as a redness of the skin which disappears temporarily upon pressure. Clinically two groups are recognized, erythema simplex and erythema exudativum. In the following pages the former type will be discussed. Erythema simplex presents a number of types, among which are erythema traumaticum, erythema caloricum, erythema venenatum and erythema intertrigo, and the different forms of symptomatic erythema, all arising from various causes.

Erythema simplex is characterized by an eruption of reddish macules of varying size, which disappear upon pressure. The causes may be internal and external, the condition arising from friction, brought about by wearing tight clothing, or from the action of an external irritant. Extremes of temperature are responsible, and, in some cases, reflex vaso-motor irritation, or the ingestion of certain articles of food or drink. Any portion of the surface of the body may be invaded. The lesions may be widely scattered. Fresh crops are usually bright red, fading as

they become older. Occasionally a slight degree of pigmentation may remain. Itching, burning and tingling, and, in some cases, more or less elevation of temperature may be present.

Erythema traumaticum.—This results from external irritation, and, like the former variety, is also due to wearing too tight clothing, and may be produced by too vigorous friction after the bath. It rapidly subsides after the removal of the exciting cause, but may, in some cases, result in acute eczema.

Erythema caloricum results from the action of extremes of temperature; very low temperature or the application of ice may produce a diffuse redness which, if continued, may cause a dermatitis; high temperature, particularly exposure to the sun's rays, will cause an erythema which may be brief, or which, in severe cases, may terminate in a vesicular eruption.

Erythema venenatum may be traced to the application of certain irritating substances, such as mustard, pepper, turpentine and ammonia.

Erythema intertrigo is a redness of the skin at points where natural folds come in contact, as the neck, armpits and thighs. It is common to infants possessing a delicate skin, and, unless promptly recognized and quickly eradicated, may terminate in an eczema madidans. Usually there is burning, itching and tingling, and a certain amount of exudation.

Symptomatic erythema arises from gastro-intestinal derangement, the action of drugs, and may accompany the eruptive fevers of childhood. Erythema infantile is a common type of the above form which is characterized by an eruption of rose-red maculæ, about the size of a dime, and results from disorders of the alimentary tract.

Erythema scarlatiniforme.—This variety is usually symptomatic. Its most common cause is reflex irritation, arising from the administration of certain drugs, such as *belladonna*,

rhus tox. and *quinine*. In some cases no cause can be found. The eruption usually appears suddenly, although it may be preceded by headache, malaise and fever. The lesions are mostly confined to the face, neck, trunk and extremities. They are macules or papules of a bright-red color, which occasionally coalesce. It may be difficult to differentiate this variety from scarlatina, particularly during the first twenty-four hours. Usually, however, the eruption quickly fades, leaving none of the grave symptoms attending scarlet fever. Burning and itching may be annoying symptoms.

Erythema medicamentosa.—This type, like the foregoing, usually follows the ingestion of drugs. The eruption is macular, and in some instances papulo-vesicular, and even pustular. Rarely it may be scarlatiniform in character. The eruption is scattered over the head, trunk and limbs, and disappears upon the removal of the exciting cause.

Treatment.—*Erythema simplex* is quickly amenable to treatment. Gastro-intestinal derangements must be corrected. Internally *nux vomica*, *pulsatilla*, *hepar*, *ippecac* and *bryonia* may be indicated. Locally, irritation may be subdued by applying an astringent powder or a weak solution of carbolic acid. *Erythema intertrigo*, if not promptly controlled, may result in a very acute eczema. Absolute cleanliness must be observed and all irritants removed. After thoroughly bathing, the parts should be dried with a soft towel and freely dusted with talcum or lycopodium powder. Oxide of zinc ointment is frequently efficacious. Internally *aconite* and *belladonna* may be administered very early in an attack; where vesicles form, *rhus tox.* should be given.

Furunculosis.

Synonyms.—Furuncle, boil.

Definition.—An acute circumscribed inflammation of a hair-follicle, sebaceous gland, and the surrounding connective tissue, ending in necrosis of the central portion, discharging a “core.”

Symptomatology.—Slight itching and burning, associated with a moderate degree of localized infiltration, marks the site of a coming “boil.” Within a day or two a conical papulo-vesicle appears, which later becomes filled with pus. This pustule is surrounded by a markedly infiltrated base, and there is considerable elevation of the skin. Where the deeper structures are involved, the skin becomes thinned and assumes a bluish hue. Within a few days the tumor may have attained a considerable size, almost that of a walnut. Intense throbbing pain, made worse by motion, adds greatly to the patient’s discomfort. Central coagulation necrosis quickly takes place, resulting in the formation of a “core,” which is expressed by suppuration, leaving one or more openings. The pain and fever then rapidly abate, and the openings quickly fill up with granulations. Deposits of pigment may persist for some time. Successive crops appear from time to time, extending over a period of months. This condition is termed furunculosis, for which a constitutional cause is frequently responsible. Boils are usually seen upon the neck, back and nates.

Pathology and Morbid Anatomy.—Inflammation of the tissues about a hair-follicle is caused by pus-germs obtaining an entrance through the follicle. Necrosis results from the development of poisons generated by these germs.

Etiology.—Single “boils” result from a microbial infection of the skin, due to the presence of the staphylococcus aureus et albus, for which an irritation arising from various causes is responsible. Furunculosis frequently accompanies and often follows an attack of scabies or pediculosis. This will be readily understood by recognizing how irritated and inflamed the skin becomes as a result of the incessant scratching accompanying these parasitic diseases, thus inviting the entrance of pyogenic organisms. Improper and tight clothing, irritating soaps, poultices, and the too lavish use of strong antiseptic lotions may be con-

tributing factors; and, too, it must not be forgotten that this condition is frequently associated with marasmus, or may follow any of the infectious diseases of infancy or childhood.

Diagnosis.—The presence upon their favorite sites of one or several painful conical elevations that suppurate and express a “core” will establish the diagnosis of furuncle. A boil is frequently mistaken for a “carbuncle.” The latter condition, however, is serious. Chill and elevated temperature are early symptoms. The skin is hard, and is not freely movable; local infiltration is pronounced. Several pustules appear which indicate sites of resulting necrosis. Fortunately carbuncle is rarely seen in infancy and childhood.

Prognosis.—Boils have a very depressing influence, and occasion much pain and discomfort. Furunculosis, if associated with other constitutional conditions, may contribute toward a fatal outcome.

Treatment.—Without doubt the most effective treatment consists in crucial incisions, followed by the application of a wet compress of a weak solution of bichloride of mercury. Internal medication is always indicated.

Hepar s. c. is an ideal drug, not only for this condition, but also for all pustular dermatoses. *Sulphur* is frequently given with brilliant results. *Silicea* is especially indicated in those cases which tend toward furunculosis. The early administration of *belladonna*, and occasionally of *aconite*, will surely minimize pain, and may abort an attack. It must be remembered that poor hygiene, uncleanly and unsanitary surroundings and improper food, play a most important rôle in the production of pustular diseases; where practicable, these conditions must be corrected.

Impetigo.

Although very few cases of non-contagious impetigo have been observed, yet because of the claims made by

Duhring ("Cutaneous Medicine"), Stellwagon ("A System of Genito-Urinary Diseases, Syphilology and Dermatology"), and Hardaway ("An American Text-Book of Genito-Urinary Diseases, Syphilis and Diseases of the Skin"), dermatologists accept a simple non-contagious type of impetigo.

Definition.—Impetigo is an acute non-contagious dermatitis, characterized by the formation of pustules.

Symptomatology.—This condition is recognized by the presence, chiefly upon the face and extremities, of a varying number of pustules about the size of a pea. These lesions, which appear at times during the course of the disease, are discrete, each being surrounded by an inflammatory base. They are well distended with a straw-colored fluid, which ends in crust-formation without rupture or umbilication. Scars never result. Itching and burning may be an annoying feature.

Etiology.—Very nearly all cases occur during infancy and early childhood. It is a local infection, for which the staphylococcus is responsible.

Diagnosis.—Impetigo simplex resembles closely impetigo contagiosa, and in atypical cases a differential diagnosis is beset with difficulties. The contagious variety is recognized by lesions of a vesico-pustular character. The lesions of impetigo simplex are invariably pustules. Umbilication is seen only in the contagious type.

Prognosis.—This disease is an acute, self-limited process.

Treatment.—Removal of the cause by proper observance of cleanliness will produce a prompt cure.

Impetigo Contagiosa.

Definition.—Impetigo contagiosa is an acute contagious dermatitis, characterized by the formation of superficial, circular or oval vesico-pustules or blebs, which rapidly form yellowish crusts.

Symptomatology.—Except in isolated cases, occurring in infants, no constitutional symptoms precede or accompany an attack. When present, however, they give rise to submaxillary and præ-aural adenopathy, together with moderate fever. The lesions are usually seen upon the face and hands. Where the fingers become involved, the lesions are situated about the tissues surrounding the nails. Exceptionally, lesions are found on the trunks and extremities.

The lesions at first are minute vesicles, later increasing in diameter, becoming vesico-pustules. Their contents are sero-purulent. Desiccation rapidly occurs, leaving brownish spots, which soon disappear. The attack lasts about a week, fresh crops appearing daily. Occasionally lesions rupture and coalesce, giving a honeycomb appearance to the group; under such conditions itching is a prominent feature.

Etiology.—Impetigo contagiosa is due to filth, and is rarely seen except in dispensary practice or among those who are improperly cared for. The disease is very contagious. Adults, however, are rarely attacked. Authorities trace the disease to the presence of the staphylococcus aureus et albus.

Diagnosis.—Impetigo contagiosa may be mistaken for impetigo simplex, varicella, the pustular type of eczema, ecthyma, and pemphigus. The features which distinguish the simple and contagious types have been mentioned while discussing the former variety.

From *varicella* it may be differentiated by the presence of lesions of a vesicular or bullous character, which appear in crops, and which in some instances leave cicatrices. Varicella is occasionally accompanied with grave constitutional symptoms. *Pustular eczema* may suggest impetigo simplex, although an eczema invariably produces more infiltration and more subjective symptoms. In eczema the lesions, although pustular, are deeper, and surrounded by an inflammatory areola. The lesions are found upon the

legs, regions rarely attacked in impetigo contagiosa. *Ecthyma* is a disease of adult life.

Pemphigus is rarely met with in infants and children. The lesions are blebs. Constitutional symptoms are present.

Prognosis.—Under appropriate treatment a rapid recovery may be looked for.

Treatment.—Warm baths should be given morning and evening. Crusts, if adherent, may be removed by soaking with olive oil. *Hepar s. c.* is occasionally demanded.

Urticaria ; Hives.

Definition.—Urticaria is an inflammatory disease of the skin, characterized by the presence of wheals.

Symptomatology.—The cutaneous lesion of urticaria is a wheal. It commences as a red spot, and rapidly spreads; in the centre a circumscribed elevation of a red color appears. This rapidly shades from rose-red to pink, and then white. In shape it is round or oval, frequently changing its size and locality, appearing from time to time upon different portions of the body. The lesions are particularly evanescent; they may last a few hours or but a few minutes, leaving behind no trace of their former presence. Rarely they persist for days; occasionally they coalesce and attain considerable dimensions. Their favorite seats are the extremities and buttocks, although they may appear on any portion of the skin or mucous membrane. Their outbreaks are invariably attended with intolerable burning and itching, and a slight degree of fever. An attack may be acute or chronic. The acute attack is usually attended with gastric derangement, headache and slight fever. The eruption appears and disappears quickly, leaving no traces save a few scratch-marks, resulting from the itching. The chronic type may last for weeks or months.

Etiology.—Hives arise from causes that are both internal and external. Certain seasons are, in a measure, respon-

sible for their outbreak; they are especially apt to appear in the spring and fall. Occasionally they accompany attacks of eczema and pemphigus. The majority of cases occurring in children may be traced directly to some gastro-intestinal derangement. Toxins are generated by reason of the ingestion of certain articles of food; fruit, particularly strawberries, are prone to excite an attack. Constipation, diarrhœa, worms, and acute or chronic indigestion may occasionally be responsible. Improper clothing, low or high temperature, and the bites or stings of insects may be exciting causes.

Pathology and Morbid Anatomy.—The wheal is formed by a circumscribed œdema of the deeper layers of the corium, caused by a contraction of the blood-vessels, followed by dilatation with transudation of serum.

Diagnosis.—The character of the wheals, their evanescence and their arrangement, associated with intolerable itching and tingling, are sufficient to establish the diagnosis. The eruption may be mistaken for *eczema papulosum* and *pemphigus*. Eczema papulosum, however, presents lesions of a papular type, which persist for a longer period. In pemphigus the lesions are bullæ. Moreover, pemphigus is a rare disease in childhood. There is usually marked constitutional disturbance in pemphigus.

Prognosis.—The prognosis is favorable in the active variety. Removal of the exciting cause, usually a gastro-intestinal derangement, will effect a cure. In the chronic form the prognosis is less favorable.

Treatment.—The treatment of urticaria is simple. Articles of diet which disagree must be interdicted. Constipation or diarrhœa, if present, must be corrected. During an attack the diet must be of the plainest kind. Locally it may become necessary to allay itching by applying a weak solution of carbolic acid, one-half of a drachm to eight ounces of water, or hot water to which has been added a little vinegar.

Aconite may be administered early in an attack to control the fever, thirst and restlessness.

Urticaria urens is indicated when itching, burning and tingling are prominent symptoms. It is indeed almost a specific.

Antimonium crudum, *arsenicum*, *nux vomica* and *pulsatilla* are of service in cases arising from gastric irritability.

Calcareo carbonica is beneficial in the chronic form.

Vegetable Parasitic Diseases: Tinea.

By the term *tinea* we mean the vegetable parasitic diseases of the skin. Those due to the trichophyton fungus are spoken of as *tinea trichophytina*. *Tinea trichophytina* affects the scalp and body.

Tinea Tonsurans.

Synonyms.—Trichophytosis tonsurans, ringworm of the scalp.

Definition.—Tinea tonsurans is a highly contagious vegetable parasitic disease of the scalp, characterized by the presence of one or several bald spots, covered with scales and containing short, broken-off hairs.

Symptomatology.—Following a period of incubation, variously estimated at from three to five days, erythematous areas about the size of a twenty-five-cent-piece appear. They are covered with grayish scales, and are accompanied by slight itching; they enlarge peripherally and may coalesce. The hairs of these parts become lustreless and break off. In some cases the scalp is entirely denuded, making a complete bald spot. Occasionally vesicles and pustules form, and a certain amount of suppuration results. Resolution may take place in one area, while the disease is active in another. The health is rarely affected.

Etiology.—Tinea tonsurans is due to the presence and growth of the trichophyton fungus. It is highly contagious, being transmissible to the lower animals, from whom

it may be contracted. It is endemic to asylums and hospitals, or where a number of children are congregated.

Pathology and Morbid Anatomy.—As a rule, only the superficial parts of the epidermis and hair are attacked in children. Microscopically mycelia and spores are seen. The hairs become brittle, but, as a rule, baldness is not permanent. The hairs usually return to their normal state.

Diagnosis.—Ringworm of the scalp may be mistaken for *alopecia areata* and *squamous eczema*.

Alopecia areata.—Baldness in alopecia areata is complete. The condition develops quickly. It may be associated with ringworm of the scalp.

Prognosis.—Isolated cases, if seen early and subjected to proper treatment, are curable within a few weeks. An epidemic occurring where a number of children dwell together is hard to eradicate. In the majority of cases a few months will be required to efface the disease, and it must be remembered that relapses are common.

Treatment.—The treatment of ringworm of the scalp is difficult and tedious. Internal remedies will be required to prevent suppuration, in which event *hepar* is indicated, or, where anæmia or scrofula exists, *arsenicum*, *thuja*, *mercurius* and *sulphur* may be advantageously employed. The best results in all cases are obtained from the application of parasiticides. It first becomes necessary to place the scalp in a condition suitable to receive local treatment. The hair about the patch and for some space surrounding it should be cut and the scalp closely shaven. The short hairs should be removed by means of suitable forceps. Scales and crusts, if present, are removed by scrubbing vigorously with a solution of green soap. Where the patches are extensive, it is necessary to shave the entire scalp. Depilation of the diseased hairs is tedious and often unsatisfactory. As a rule the hair is brittle and breaks off, not coming out entirely. The process, however, should be practiced daily.

Locally the best application is bichloride of mercury, one to one thousand; it should be discontinued if it excites active inflammation. Carbolic acid, one drachm to one pint of water, is frequently efficacious. Among other agents are sulphur ointment, a five per cent. ointment of the oleate of mercury, and equal parts of the oil of cade and olive oil. After an apparent cure, the scalp should be treated every other day, to prevent the possibility of a relapse.

Tinea Circinata.

Synonym.—Ringworm of the body.

Definition.—Tinea circinata is a highly contagious vegetable parasitic disease of the skin, caused by the trichophyton fungus, characterized by the presence of several patches of varying size and character and occurring upon any part of the surface of the body.

Symptomatology.—Ringworm of the scalp and ringworm of the body are usually found existing together. Minute, irregularly-shaped spots of a reddish-brown color indicate the commencement of ringworm of the body. Later a distant circular patch is seen, which heals in the centre and spreads peripherally. Around the margin of each patch small papules and papulo-vesicles are seen. Scaling is a decided feature. The typical ringworm is usually about the size of a dime, and it stands out prominently from the surrounding skin. In some instances the rings join together. Any part of the body may become affected, although the face and hands are most frequently attacked. Next to these localities, the axillary and inguinal folds are involved.

Etiology.—Tinea circinata is due solely to the presence of the trichophyton fungus. The disease is highly contagious. Adults are often attacked. It is, however, a common disease of childhood.

Diagnosis.—Tinea circinata may be mistaken for *seborrhœa* and *eczema squamosum*. In seborrhœa the scales are

greasy and the fungus is absent. Should any doubt exist as to the diagnosis, a microscopical examination will usually detect the fungus.

Prognosis.—An acute attack is quickly curable, but in the anæmic and poorly nourished it may be quite rebellious to treatment.

Treatment.—The fungus can be destroyed by scrubbing the lesions every morning and evening with green soap and hot water, and afterwards applying a 10 per cent. ointment of ammoniated mercury. In obstinate cases a cure may be obtained by painting the patch and the skin about its margins with a 25 per cent. aqueous solution of ichthyol. Care must be observed in using ichthyol, since it is likely to provoke an acute dermatitis. Internally *hydrastis*, *natrum muriaticum*, *sepia* or *graphites* may be indicated.

Animal Parasitic Diseases : Pediculosis.

Synonyms.—Phtheriasis, lousiness.

Definition.—Pediculosis is a contagious animal parasitic disease, caused by *pediculi*, or lice, producing both primary and secondary lesions.

Symptomatology.—In infants and children pediculosis is, as a rule, confined to the scalp. The uncleanly are mostly attacked. These parasites attack the scalp, causing much itching and scratching; escape of serum and purulent fluid occurs, forming crusts. The hairs become matted together; scratch-marks, pustules, excoriations and furunculi contribute to this unsightly condition. The cervical glands become tumid and enlarged.

Occasionally an eczematous condition of the scalp accompanies *pediculus capitis*. Pediculi are found both upon the scalp and the hairs. Their nits are usually upon the hairs. The term *plica polonica* has been applied to an aggravated state of lousiness, where living and dead lice and their nits have matted the hairs together, a most offensive odor arising from the decomposing pus and crusts. Severe in-

roads are in some instances made upon the general health, traceable to the annoyance coincident to incessant itching and scratching.

Etiology.—The head-louse is alone responsible for *pediculus capitis*. The disease spreads by contagion.

Diagnosis.—The detection of pediculi and their nits, together with their resultant secondary changes, will at once establish the diagnosis.

Prognosis.—Lousiness is amenable to prompt treatment.

Treatment.—Naturally local treatment is indicated. Kerosene oil is the best remedy with which to kill the parasites and their ova. It should be applied freely, and the scalp subsequently covered with a muslin or oiled-silk cap. On the following day the head should be shampooed with soap and water, followed by the liberal application of acetic acid, the latter remedy serving to destroy the nits. This procedure may have to be repeated a number of times before a cure is completed. Should eczema of the scalp be present, it must receive suitable treatment. No internal remedy is indicated, except in debilitated subjects. In such cases gratifying results may be obtained by administering either *iodine*, *sulphur*, *calcareo carbonica* or *viola tricolor*.

Scabies; Itch.

Definition.—Scabies is a contagious animal parasitic disease of the skin, which is produced by the *acarus scabiei*.

The male itch-mite rarely burrows beneath the epidermis. The female, however, penetrates more deeply, making minute tunnels, which serve as its habitat. The *acarus* selects those regions where the skin is tender, as the axillary and interdigital spaces, producing papules, vesicles, pustules, bullæ, wheals, infiltrations, furuncles and crusts. Rarely is the face attacked, although the writer recalls the case of a youth, seen in consultation, where an intractable parasitic eczema of the face resulted from scabies.

Pathology.—Inflammation of the papillary layer of the skin results from the presence of the *acarus*. Itching,

which is usually intense, is a very distressing symptom. It is particularly severe during the sleeping hours, since the female acarus is liveliest when the patient is protected by the warmth of the bed-coverings.

Etiology.—Uncleanliness invites the disease. Personal contact covering a prolonged period is also responsible. The itch-mite is alone the exciting cause.

Diagnosis.—The diagnosis of scabies is not attended with any difficulty. The presence of characteristic lesions, situated in the interdigital and other favorite regions, associated with marked and distressing itching, should lead one to a positive opinion. Scabies may, however, be mistaken for eczema and pediculosis.

Eczema.—This disease presents many, but by no means all, of the multiform lesions which accompany scabies. Itching is confined to the diseased parts. Pediculosis causes itching only of the parts attacked. Itching as a symptom of scabies is frequently referred to parts unattacked. Some confusion may exist where eczema or impetigo occurs in a subject already affected with scabies.

Prognosis.—A rapid recovery may be expected where anti-parasitic treatment is instituted early; otherwise, scabies may assume a somewhat intractable feature.

Treatment.—Locally the best results are obtained by applying the following ointment, as suggested by Kaposi:

R. Beta naphthol,	.	.	.	.	.	.	.	grs. xl.
Saponis viridis,	.	.	.	.	.	.	.	ʒiiss.
Creta preparat.,	.	.	.	.	.	.	.	ʒss.
Adipis,	.	.	.	.	.	.	.	ʒss.

Great care, however, should be exercised in using this preparation, since the long-continued use of *beta naphthol* has been known to excite an acute nephritis; and, too, both *beta naphthol* and green soap possess marked irritating properties. Indeed, in cases exhibiting an active dermatitis, it is preferable to substitute a less irritating ointment.

Fisher* suggests:

R. Sulphur,	.	.	.	.	.	.	.	.	5iij.
Balsam of Peru,	.	.	.	.	.	.	.	.	3iij.
Adipis,	.	.	.	.	.	.	.	.	3ss.
Petrolati,	.	.	.	.	.	.	.	.	3ss.

The strength of these several ingredients may be diluted, should they not be readily tolerated. Their application should be preceded by a very warm bath, after which a small portion of the ointment should be thoroughly rubbed in upon all parts of the skin, omitting, of course, the infra- and supra-orbital spaces. This should be repeated daily until a cure results. Dermatitis, if excited, may be controlled by ceasing the use of these ointments and instituting appropriate treatment. In order to prevent reinfection, the clothing should be subjected to an extreme degree of heat. Occasionally the health becomes undermined by reason of the incessant itching and scratching. In such instances internal remedies are indispensable.

Sulphur is an ideal remedy. It is particularly indicated in scrofulous and uncleanly children.

Arsenicum may be administered where anæmia, prostration and marasmus complicate the disease.

Iodine.—In not a few cases pediculosis and scabies have been seen existing together with an active syphilis. The scalp and nails are the seats of degenerative changes; swollen glands and painful nodosities may add to the patient's discomfort. In such cases *iodine* is of inestimable worth.

Hepar sulphur calcaria possesses decided virtues in scabies, as well as in many other skin diseases presenting lesions of a vesico-pustular character.

Particular attention to proper food and hygiene must not be omitted.

* "A Hand-Book on the Diseases of Children and Their Homœopathic Treatment," p. 771.

CHAPTER XV.

DISEASES OF THE BLOOD.

THE blood in childhood has a lower specific gravity and a smaller relative amount of fibrin than in adult life. The *red corpuscles* are more numerous, particularly in early infancy, and a few enucleated red corpuscles, or erythroblasts, are found at this time, but later in infancy their occurrence will denote a pathological condition.

The *white corpuscles* are also more numerous than in the adult, and, according to Ehrlich, five different varieties are to be distinguished, viz., small mononuclear cells, or lymphocytes; large mononuclear cells; mononuclear transition forms; polynuclear cells, and eosinophile cells. The latter are rare in normal blood, being characteristically increased in spleno-medullary leukæmia. Their affinity for eosine gives them their name. The polynuclear cells are the most numerous form of leucocyte in normal blood, being increased in number, together with the mononuclear or “unripe” forms, in those varieties of leucocytosis which are to be distinguished clinically from leukæmia, excepting the lymphatic variety of leukæmia, in which the lymphocytes (which are derived from the lymphatic glands) are present in the largest proportion.

The percentage of *hæmoglobin* during childhood is lower than in adults, not attaining the accepted clinical standard of 100 per cent. until puberty, and under normal conditions the percentage estimated by the hæmometer will vary from 60 per cent. to 80 per cent.

Anæmia.

While the term “anæmia” indicates a deficiency of blood or of some of its constituents, from whatever cause, or a

local absence of blood-supply from mechanical obstruction (ischæmia), the medical aspect of this condition resolves itself into a consideration only of those abnormal blood-states developing primarily or accompanying some grave illness affecting the blood and blood-making organs secondarily. To the class of *primary* or *essential anæmia* belong chlorosis and progressive pernicious anæmia. *Secondary*, or *symptomatic, anæmia* comprises those cases which result from hæmorrhage; inanition; rickets; nephritis; long-continued suppurative processes; syphilis, tuberculosis and malaria; and from certain poisons, such as lead, mercury and arsenic.

The symptoms of *secondary anæmia* are pallor of the skin and mucous membrane; malnutrition and exhaustion; indigestion and constipation; shortness of breath upon exertion; hæmic murmurs over the base of the heart. Both the number of red corpuscles and the percentage of hæmoglobin are reduced—a point of distinction between symptomatic anæmia and chlorosis, in which the number of corpuscles is but slightly affected, while a marked reduction in the percentage of hæmoglobin takes place. In progressive pernicious anæmia the reduction in the number of red corpuscles is the characteristic condition, their number being lower than in any other variety of anæmia, also exceeding the reduction in the hæmoglobin percentage. Beside these hæmatological data, there is usually little difficulty in tracing one of the above-mentioned etiological factors to establish the diagnosis of symptomatic anæmia.

Chlorosis.

Chlorosis is a form of primary anæmia which is seen most frequently in girls at the time of puberty, but it is not necessarily confined to this period of life nor to the female sex. Of the etiology nothing positive is known excepting that unhygienic surroundings, improper or insufficient food, lack of fresh air and sunshine, emotional dis-

turbances and obstinate constipation are frequently intimately associated with the development of chlorosis. The heart and larger blood-vessels have been demonstrated by Virchow as under-developed in many instances.

The *symptoms* of chlorosis may make their appearance rapidly, or the disease may not be suspected for a long time until pallor and the characteristic greenish tint of the skin, on account of which it is popularly known as “green sickness,” give a clue to the existing ill-health. The child complains of headache, and displays an aversion to mental or physical exertion of any kind. The latter results in dyspnœa and palpitation, while the headache and languor induce indifference both to work and to play.

The appetite is poor, and in many instances becomes perverted, so that the patient craves chalk, slate-pencils, coffee beans, etc., which are apparently enjoyed. Indigestion and constipation are troublesome symptoms, and their correction materially hastens the cure.

In young girls, menstrual derangements are inseparably associated with chlorosis. Thus, scanty menstruation or amenorrhœa are almost invariably encountered in these cases; likewise, dysmenorrhœa and leucorrhœa are common. Improvement in the chlorotic condition results in prompt improvement here.

The red corpuscles are but slightly decreased in number, but there is a pronounced deficiency of hæmoglobin, giving the individual corpuscles a noticeably pallid appearance.

Œdema tends to develop about the ankle-joints, and many patients present a puffy, fat appearance, indicating a hydræmic state, with sluggish return circulation. The degree of anæmia can be roughly estimated by the appearance of the palpebral conjunctiva, the lips, and the matrix of the nails; and, in the absence of accurate percentage estimations of hæmoglobin with the hæmometer of Fleisch or Gowers' hæmoglobinometer, the progress of the case is to be noted by these indices.

The *prognosis* of chlorosis is favorable, and it usually responds promptly to treatment, although liability to relapses exists. Its predisposing tendency to tuberculosis renders it dangerous when occurring in individuals with tuberculous antecedents.

Progressive Pernicious Anæmia.

This form of primary anæmia is a rare disease, and is more seldom seen in children than in adults. Quite a sufficient number of cases, however, are on record to assign it at least a brief mention in a work upon the diseases of children. The *etiology* is obscure. Birch-Hirschfeld advances the infectious theory, owing to the presence of tissue destruction and retardation of blood-coagulation; others hold to the theory of increased hæmolysis, and again others to decreased hæmogenesis. A case traceable to neglect and improper feeding is reported by Ashby and Wright.* The anæmia resulting from intestinal parasites is very difficult to distinguish from pernicious anæmia, showing the great liability for error and the difficulty with which a study of the disease is beset, as so many other causes are capable of inducing pronounced anæmia. In eighteen cases seen by Osler† there was absolutely no appreciable cause for the disease. Hensch‡ saw two children in the same family die of this disease, no cause being ascertainable.

The symptoms are those of a gradually increasing anæmia. Loss of flesh may be absent. Œdema and hæmorrhage may supervene. The skin assumes a characteristic lemon-yellow tint. Anorexia, vomiting and other digestive disorders accompany the condition. The patient eventually dies from exhaustion. As the name implies, the entire course is a progressive and pernicious one. The condition of the blood has been described above, under *Anæmia*.

* "Diseases of Children."

† "Amer. Text-Book of Practice."

‡ "Vorlesungen ü. Kinderkrankh."

Treatment.—The hygienic management of cases of anæmia is important, and the physician must study his case carefully before determining upon the question of diet, exercise, and rest. In chlorosis it is especially important to improve the condition of the bowels, and the selection of a diet to overcome constipation is a great advantage to the patient. Fruits and green vegetables, many of which are rich in iron (notably spinach), are very beneficial. For anæmia in general it may be said that the most nutritious and most digestible form of food is to be selected. The impoverished and watery condition of the blood diminishes the organic elements of the digestive secretions, for which reason it is often desirable to aid the digestion by the employment of digestive ferments, such as pepsin or papain, or, as Thompson* recommends, to employ predigested foods, making use of pancreatin in the preparation of animal food, and diastase or malt extracts for the predigestion of amylaceous food.

Milk is an ideal food in all forms of anæmia, and chlorotic subjects may drink of it freely, even between meals. Eggs are also very beneficial, being easily digested, and their yoke containing a large proportion of iron. There is too great a risk in using raw beef, but meat is usually not well digested by these patients unless given practically raw. A good red wine often proves most beneficial.

Where exhaustion is a prominent symptom, rest rather than exercise should be prescribed. Absolute rest in bed, with massage and liberal feeding, will accomplish more for such cases than all attempts at forcing matters by heroic means.

The following remedies are the ones most useful in the various forms of anæmia:

Bell.—In *chlorosis*, when there is violent palpitation; throbbing headache; great weariness and desire to sleep

* "Practical Dietetics."

in the afternoon; debility. The symptoms of *belladonna* are very similar to those of *ferrum*, especially the palpitation, dyspnœa and rush of blood to the face, alternating with paleness; but there is not that intense anæmia and persistent debility, gastralgia, vomiting, amenorrhœa and anasarca indicating the latter remedy. *Ferrum* is seldom of use elsewhere than in *chlorosis*, to which condition it is strictly homœopathic, as indicated by its symptomatology. Here it has gained universal reputation, and even as prescribed empirically by the old school in large doses it is frequently of great benefit, owing to its favorable action upon the intestinal tract, by uniting with the hydrogen sulphide gas in the intestines. In this way the assimilation of the organic iron compounds present in the food are permitted to be assimilated, an impossibility in the presence of free hydrogen sulphide gas. No doubt such remedies as *pulsatilla*, *nux vom.* and *spigelia* owe their prominent usefulness in chlorosis to their influence upon the alimentary tract, and when they are indicated the use of iron is seldom necessary for the cure of the case. Many preparations of iron are in vogue, each form having its ardent advocates. *Ferrum redactum* in the first decimal trituration is one of the most reliable preparations; the *oxalate of iron* finds great favor with many of the British homœopathists in chlorosis. The *citrate of iron and strychnia*, second decimal and third decimal trituration, is a preparation which stands highly recommended, but which has so far given us no promising results.

Graphites.—*Chlorosis*; tendency to obesity; sluggish circulation and anæmia, with general coldness; delayed or scanty menses; obstinate constipation; sad, tearful disposition.

Natrum mur.—*Chlorosis*; obstinate cases; fluttering of the heart; craving for salt.

Nux vom.—*Chlorosis*; gastric derangements; constipation; irritability; prostration; languid, especially morning on rising from bed; perverted appetite.

Pulsatilla.—*Chlorosis*; great weakness and sluggishness of the circulation, manifesting itself as chilliness; coldness and paleness of face; relief in open air. Anorexia; nausea; palpitation of heart and dyspnœa; sharp pains about heart (compare also *spigelia* and *cactus*, both of which are indicated by their cardiac symptoms); amenorrhœa; leucorrhœa; sad, tearful disposition. *Cyclamen* is similar to *pulsatilla*, but this remedy has aggravation of symptoms in the fresh air, due to great sensitiveness to cold.

Other important remedies in chlorosis are *calc. c.*, *helonias*, *sepia*, and *sulphur*.

Symptomatic anæmia finds in *china* a most valuable drug. *China* is indicated after hæmorrhages; chronic diarrhœa; long-continued suppuration; and in all mild forms of idiopathic anæmia as a “tonic,” given in doses of two to three drops of the tincture, three to four times daily.

Arsenicum corresponds more closely to the *pernicious forms of anæmia* than any other remedy, and is also indicated in the anæmia of malaria and of Bright’s disease. Its indications are excessive debility; œdema of the ankles and eyelids; cardiac weakness and dyspnœa; gastric irritability. It may also be required in severe cases of chlorosis.

Kali carb., *phosphoric acid* and *silicea* are useful in the anæmia of debilitating diseases, such as typhoid fever, following well after *china*.

Leukæmia; Pseudo-Leukæmia; Splenic Anæmia; Hodgkin’s Disease.

The varieties of anæmia described under the above titles present as their most characteristic features permanent leucocytosis and splenic enlargement.

Their differentiation presents many points of difficulty which can only be definitely settled by careful hæmatological examinations. Aside from the pseudo-leukæmic anæmia of infants, they are seldom encountered during childhood. They all present an unfavorable prognosis.

Leukæmia may affect persons of all ages, but it is rare during childhood. Its symptoms are anæmia, pronounced pallor, distended abdomen, with enlargement of the spleen, and tenderness. The lymphatic glands may be principally involved, giving the *lymphatic variety*, or the spleen and bone-marrow in the *spleno-medullary variety*, a fine form of distinction, only made possible by an examination of the blood. In the first form there is a great increase in the small mononuclear cells, the other forms being diminished, while in the second form there is a relatively small increase in the lymphocytes, but a great increase in the eosinophile cells of Ehrlich.

The disease assumes a progressively downward course, usually terminating in general œdema, hæmorrhages and exhaustion.

Hodgkin's disease presents enlargement of various groups of the lymphatics; enlargement of the spleen and liver; fever of an intermittent type, and progressive anæmia and leucocytosis; but the latter never attains the degree found in leukæmia. The cervical and axillary glands, or those situated near by, are usually the ones first affected, other groups eventually becoming implicated. They do not, however, tend to break down, this being a strong point of differentiation between Hodgkin's disease and *tuberculous adenitis*. The course is chronic, and although the child may live for a long time, it will ultimately succumb.

Pseudo-leukæmia, or *Anæmia Infantum Pseudo-leukæmica* (v. Jaksch), is a disease of childhood, usually seen before the second year. The *etiology* is obscure. It was first described by v. Jaksch, its characteristics being: occurrence in infancy; oligocythæmia and oligochromæmia; permanent leucocytosis; marked splenic enlargement, and at times lymphatic enlargement. The liver is but slightly enlarged, a clinical distinction between this disease and leukæmia. The prognosis is more favorable than in the latter disease, but many cases prove fatal nevertheless. The term

splenic anæmia has been applied to a class of cases similar in all respects with the above, excepting in that leucocytosis is absent.

The development of pseudo-leukæmia is one of progressive pallor, failure in general health, digestive disturbances, and at times slight pyrexia. The anæmia is very noticeable, and palpation reveals an enlarged spleen. No doubt many cases described as pseudo-leukæmia are in their true nature really nothing more than aggravated types of rickets, for anæmia, digestive derangements and enlarged spleen are all found in well-developed rickets. The possibility of a malarial and syphilitic influence must also be excluded to establish a correct diagnosis. The *course* is the same as in the other leucocytoses, the characteristics being chronicity and lethal termination, although the chances for recovery are greater in pseudo-leukæmia than in Hodgkin's disease or in true leukæmia.

Treatment.—Homœopathic literature on these affections is meagre. Of our writers, Gilchrist enters most extensively into the subject in an article upon “Leucocythæmia”* [leukæmia], in which he also reports a case of Dr. Gaylord's represented as leukæmia, which, however, should be classed as a case of anæmia infantum pseudo-leukæmica. The patient was an infant of six months, anæmic from birth, living in a malarial district. There was leucocytosis and splenic enlargement. *China* 2x and an occasional dose of *ferrum* resulted in a cure. Dr. Broadbent† recommends *phosphorus* as the most appropriate remedy in leukæmia, and v. Grauvogl‡ considered *natrum sulph.* and *thuja* as most prominently indicated, for he considered these disturbances as a form of sycosis. Gilchrist believes *china* and *phosphorus* to be the most closely related remedies to the disease. The old school ties to *arsenic* in conjunction

* Arndt's “System of Medicine.”

† “Hom. Review,” vol. xxi.

‡ “Lehrbuch der Homœopathie.”

with *iron* and *cod-liver oil* in leukæmia, pseudo-leukæmia and Hodgkin's disease, although they claim no positive results from this form of treatment.

For the complications of leukæmia, Gilchrist recommends:

Hæmorrhages: *Carbo veg.*, *elaps cor.*, *crocus sat.*, *erigeron can.*

Hæmorrhagic tendency: *China*, *phos.*, *calc. c.*

Diarrhœa: *Ferrum acet.*, *veratr.*, *china*, *sulph.*, *phos.*

Hæmophilia.

The subjects of hæmophilia are commonly known as "bleeders," from the tendency to profuse and often uncontrollable hæmorrhages which this form of constitution presents. The disease is hereditary, and the mode of transmission is a clear demonstration of atavism through the female, as hæmophilia rarely occurs in females, being transmitted by the daughters of bleeders to their male offspring.

The pathology of hæmophilia is not understood. In some instances it would seem to depend upon an abnormality in the walls of the small blood-vessels, and in others upon a delayed coagulation of the blood. The peculiarity which some cases present of only bleeding excessively in certain localities would favor the first-mentioned explanation.

The diathesis usually develops early in childhood, by the end of the first dentition period, when an accidental cut or injury first attracts attention to this tendency. Beside the danger of hæmorrhage from a traumatism or an operation, there is even as great a one from spontaneous hæmorrhage, such as epistaxis, hæmatemesis, hæmoptysis, hæmorrhage from the mouth, intestines, urethra, etc. Injuries without destruction of continuity of the skin are followed by profuse bloody effusions into the subcutaneous structures.

The hæmorrhagic diathesis cannot be recognized until a

hæmorrhage has taken place, and the subjects are usually healthy-looking, apparently robust individuals, characteristically supposed to have blonde or reddish hair, blue eyes, and a fair, transparent skin. There is a strong tendency to joint-affections of a painful type, which may resemble rheumatism of the larger joints closely. A hæmorrhage may be preceded by an attack of arthritis or circulatory disturbances, such as oppression, palpitation, and rush of blood to the head.

The *prognosis* is always grave, one-half of the cases dying before the seventh year. As there is a tendency to outgrow the condition, the prognosis becomes more favorable with advancing years. There seems to be no untoward effect upon the functions of menstruation and parturition in female bleeders; another argument in favor of the origin of the disease in the vascular system, probably an inherited inefficiency in the endothelium of the capillaries distributed over certain areas.

Treatment.—Power* advises against the use of styptics in hæmophilia, as they are always useless. A case has come under my notice in which the thermo-cautery had to be resorted to after the extraction of a tooth. The application of fresh blood to the wound has acted successfully (Bieudwald). The inhalation of carbonic acid gas† has a decided influence over the epistaxis, which may also require plugging of the nares.

As a constitutional remedy, *phosphorus* corresponds most closely to the condition. The remedies which have won favor in the control of hæmorrhages of various types, such as *crigeron*, *crocus*, *hamamelis*, *secale*, *carbo veg.*, *china* and *bell.*, may be of use in special cases.

Purpura.

Purpura, or *morbus maculosus*, includes a variety of affections characterized by the development of reddish macules

* "Surgical Diseases of Children."

† Wright, "British Med. Jour.," 1894.

of varying size, indicating extravasations of blood into the skin.

It occurs *symptomatically* after the administration of certain medicinal substances, in the course of certain of the infectious fevers, and from cachectic, mechanical and neurotic influences, and *primarily* in the following clinical forms: *Purpura simplex*, *purpura rheumatica*, *Henoch's purpura*, and *purpura hæmorrhagica*.

Purpura simplex is characterized by the appearance of crops of purpuric spots, mainly upon the legs, which may be accompanied by slight fever, articular pains and diarrhœa. The spots are bright red in color, do not disappear upon pressure, and gradually fade to a purplish and later to a greenish or dirty-yellow shade, as is the course pursued by all purpuric spots. The duration is short, seldom exceeding ten days. A rheumatic history is often present.

Purpura rheumatica, or *peliosis rheumatica* (Schönlein), as the name implies, bears a strong relationship to rheumatism. The purpuric rash develops in conjunction with multiple arthritis. The onset is usually that of an atypical rheumatic fever: lassitude, fever, sore throat, articular pains, and in the course of a few days the rash appears, which may be associated with urticaria. It is more common in adults than in children.

Henoch's purpura is, according to his own description, a complicated clinical picture, in which vomiting, intestinal hæmorrhage and colic are associated with the purpura and articular swellings found in the above-described variety.* The *prognosis* of this variety is usually favorable, Henoch reporting six cases, with recovery in all, and Osler eleven cases, with three deaths.†

Purpura hæmorrhagica (*morbis maculosus Werlhofii*) is distinctive from the above forms of purpura in the absence of rheumatic manifestations, and in the predominance of

* "Vorlesungen ü. Kinderkrankh."

† "Amer. Jour. of Med. Sciences," Dec., 1895.

the hæmorrhagic disposition. It most frequently develops in young, delicate girls, the onset of hæmorrhages being preceded by several days of languor, headache, loss of appetite, and even moderate fever. The spots may extend over the entire body, their size varying from that of a pin-head to that of a pea or bean. The maculus are often interspersed with vesicles, produced by circumscribed hæmorrhages into the rete malpighii. The cutaneous hæmorrhages are followed by bleeding from the mucous membranes and internal organs, particularly from the kidneys. The duration is from ten days to two weeks in favorable cases. Death may result from gradual exhaustion, or from a sudden extensive hæmorrhage or a cerebral hæmorrhage.

Purpura fulminans is a variety of purpura hæmorrhagica occasionally seen in children. It is characterized by its rapidly-developing cutaneous hæmorrhages, which may prove fatal before other hæmorrhages have had time to manifest themselves. It offers the worst prognosis of any form of purpura.

Treatment.—In cases of simple purpura and the rheumatic forms in general, the best results will be obtained by prescribing for the underlying constitutional condition. Such remedies as *bryonia*, *ledum*, *arnica*, *hamamelis*, *rhus tox.* and *sulphur* meet with the requirements of most cases.

In the hæmorrhagic form a different line of remedies is indicated. *Crotalus*, *lachesis*, *kali hydrojodicum*, *phosphorus*, *rhus venenata*, *secale*, *sulphuric acid* and *ledum* are to be consulted as most homœopathic to this condition.

CHAPTER XVI.

DISEASES OF THE NERVOUS SYSTEM.

THE investigation of nervous diseases in children presents, for obvious reasons, many difficulties. Not only is the child unable to express its sufferings or describe its condition with any amount of accuracy, but we are also confronted with the difficulty of properly estimating the degree of suffering present from the outward manifestations, and the differentiation of conditions arising from purely reflex and transient causes from those of a more serious and permanent nature.

In many forms of disease the condition becomes at once apparent, and we are enabled closely to study the pathological processes in question by direct observation. Cutaneous eruptions, iritis, a broken bone—these are conditions which we are enabled to observe in a purely objective manner and directly recognize. In nervous diseases, however, the lesion is sudden, and a diagnosis is only to be arrived at by a process of strict induction. This involves the study of individual symptoms in each case, and, by recognizing their clinical significance, deciding as to the character and location of the pathological condition under consideration. Thus, in our examination we may find paralysis, atrophy, contracture, tremor or convulsion, and by studying these symptoms in conjunction with the history and associated symptoms—the value of which have already been ascertained—we are furnished with the data for diagnosis.

Certain physiological peculiarities of the nervous system in infancy must be recalled in order to understand the significance of some of its disturbances. Thus, the rapid growth and immaturity of the brain predispose it to certain

functional and inflammatory disturbances rare at a later period. The inhibitory centres not being fully developed, and functioning only imperfectly, slight reflex irritations which an older child would learn to disregard are resolved into motor or vasomotor discharges of more or less gravity. Again, slight organic lesions, by reason of the secondary degenerative changes following them and the interference with the growth and development of adjacent parts at a time when the brain should be uniformly and rapidly developing, leave behind them the most serious and oftentimes obscure consequences.

An objective examination of the child reveals abnormalities in the development of the body as a whole or in certain parts. Thus, the head may be too large or too small, irregular in outline or abnormal in shape. Likewise, abnormalities in the muscular system are readily noted—atrophy or hypertrophy; paresis or paralysis of certain muscle-groups, with resulting deformity, or peculiarity of the gait; incoördination of motion, tremor, localized or general convulsions, and choreiform movements. The state of the pupils and of the reflexes, and the presence of anæsthesia or hyperæsthesia, are also of significance.

By this method of examination the location of a lesion is ascertained, but its real character can at times only be defined by extending our researches back to the child's previous history and to the family history. Knowing the prominent rôle played by such constitutional diseases as rickets, tuberculosis, syphilis and rheumatism in the etiology of nervous diseases in children, and the possibility of identical clinical manifestation resulting, *e. g.*, from a tuberculous lesion in one case and from a syphilitic one in another, the importance of this mode of research becomes at once apparent.

Insanity.

Insanity as a primary affection is rare during early childhood, but at the period of puberty it readily occurs in the

offspring of neuropathic parents. Traumatism, inflammatory affections of the brain, and other nervous diseases, such as epilepsy and hysteria, are causes next in importance to heredity. In young children a moral perversion may show itself as a result of deficient intellect, this, probably in all cases, being due to some actual physical defect in the child's brain or body.

Children in whom the tendency to mental derangement is present are generally dragged, so to speak, into their insanity through mental overwork, grief, shame, excessive emotional excitement, maltreatment, masturbation, and similar factors. In other words, as soon as a severe strain is brought upon the nervous system they give way, and their mental instability becomes at once apparent.

While insanity in children may assume a variety of phases, its manifestations cannot extend beyond the simplicity of the child's mentality. Juvenile insanity, therefore, resembles the insanity of adults in every respect excepting that it is limited in its development. Again, certain forms of insanity observed in the adult are scarcely, if ever, observed during childhood.

Moral insanity usually shows itself early, as it depends upon a deficiency in the entire intellectual sphere.

Mania may occur as a primary affection or be a symptomatic accompaniment of epilepsy, hysteria or chorea.

Epileptic insanity manifests itself as attacks of mania, with strong tendency to dementia or mental enfeeblement.

Hysterical insanity presents that form of mental instability in which the emotional faculties are unduly and unrestrainedly exercised, while there is a notable lack of will-power which may culminate in outbursts of violence, accompanied by alternate sobbing and laughing, or it may appear as the graver psychoses represented by hysterio-epilepsy and catalepsy.

Melancholia is seldom seen before the eighth year, but it is a common form of insanity among children. The same

course is pursued as in adult cases. Both mental and physical depression, with self-persecution, characterize the condition. Attempts at suicide are not infrequent. The prognosis as to recovery is good, but a tendency to recurrence of insanity later in life is apt to persist.

Periodic and circular insanity is almost unknown in children. In periodic insanity there are successive attacks of mania or melancholia, alternating, perhaps, with lucid intervals; circular insanity is characterized by an alternation of maniacal and melancholic stages, followed by a lucid interval, with recurrence in the same or very rarely reverse order.

Paranoia, primary delusional insanity, or progressive systematized insanity, is a form of mental aberration of obscure and indefinite origin, gradually evolving with the growth of the individual.

In its fully developed state delusions of persecution and grandeur are developed, existing as fixed ideas, which it is impossible to overcome or eradicate. Long before mental disease is apparent or suspected the paranoiac is suspected of being odd or peculiar.

Exclusiveness; mental precocity in philosophical, religious and inventive directions; irritability of temper and cruelty are signs offering a sad outlook for the child's future mental state, especially when they are encountered in a family with psychopathic tendencies.

Dementia.—Paretic dementia is exceedingly rare during childhood; however, such conditions as epileptic insanity and masturbation insanity, which are relatively common during childhood, show a strong tendency to terminate in dementia, thereby frequently leading to its development at a much earlier period than usual.

Masturbation insanity is a form of mental disease in which masturbation exists as an uncontrollable condition, eventually developing a complete intellectual breakdown. In spite of the best-directed efforts the habit can seldom be

brought under control, the patient gradually degenerating into a state of idiocy or dementia. As the case progresses the habit is so engrafted upon the mind that it practically becomes a mental process, and all sorts of devices are utilized to evade detection. It is not at all rare to find the habit already established long before puberty. A tendency to masturbate exists in all mental derangements in children, but never to such a pronounced degree as in this special form of disease.

Morbid fears and *night terrors* are temporary mental disturbances in which hallucinations of various kinds are developed in the child's imagination through fright, or through the suggestions resulting from the recital of ghost-stories and fairy-tales, or from vicious threats. A common cause for *disorders of sleep* is gastro-intestinal irritation; but in these the symptoms are reflex in character, and do not approach the nature of a psychosis, as do the above. In neurasthenia and lithæmia similar disturbances are observed. The idiopathic fears and terrors point to a highly neurotic form of constitution, and they may indeed be the forerunners of a more serious mental trouble.

Idiocy and Imbecility.

The term "feeble-minded" is employed to include all cases from the mere mentally backward down to the so-called imbecile or idiotic, the distinction being only one of degree. Imbecility denotes a lesser amount of mental incapacity than idiocy, which is thus defined by Ireland:* "*Idiocy is mental deficiency, or extreme stupidity, depending upon masturbation or disease of the nervous centres, occurring either before birth or before the evolution of the mental faculties in childhood.*"

In the etiology of idiocy hereditary transmission plays an important rôle; of all mental derangements it is the one most frequently propagated by descent. A neuropathic

* "Mental Affections of Children."

family tendency; parental imbecility or insanity; consanguine marriages; the tuberculous diathesis; drunkenness, and worry or fright of the mother during pregnancy, are all well-established causes of idiocy. The lesions responsible for idiocy are either present at the time of birth, having developed *in utero*, as in genetous idiocy, or they may develop late, as in the case of traumatic, inflammatory, epileptic and paralytic idiocy. The determinate causes or pathological conditions rendering the child idiotic are lack of development or nutrition, or disease or injury affecting the brain either before or after birth.

The following classes of idiocy are recognized by Ireland:*

Genetous idiocy, cases which cannot be traced back to any known specific disease, and whose pathology cannot be properly diagnosed until after death. The condition of mental deficiency is *complete before birth*, and a neuropathic family history or some one of the conditions above mentioned is usually ascertainable to account for the direct hereditary transmission of the disease.

An interesting developmental abnormality common in the subjects of genetous idiocy is the high-vaulted and narrow palate. The mental state of the idiot may be said to remain at the status of the infant, or very slowly move toward the maturer state of the adult, never, of course, attaining a high degree of perfection.

The expression of the idiot is generally good-natured and confiding; the head is not necessarily small, although irregularity of formation, flatness in the occipital region and a rapid slope of the clivus are often present. The early symptoms of genetous idiocy are inability of the infant to suckle well, a feeble grasp, failure to react to sensory impressions and sight, and backwardness in walking and talking. The occurrence of such symptoms in the presence

* *Loco cit.*

of a vitiated heredity should always arouse our suspicions. Genetous idiocy forms the largest class of all cases of idiocy, and the prognosis is better than in those cases in which the child has been born with full possession of his brain-power, and has afterwards been deprived thereof.—(LANGDON DOWN.) Varieties of genetous idiocy are the *Mongolian type*, so-called from the resemblance these children bear to the Mongolian race, and the *amaurotic type*, first described by Sachs. The infant is apparently healthy at birth in this type, but in the course of a few months begins to droop and manifest signs of mental and physical breakdown, with amaurosis. The outcome is fatal.

Microcephalic and *hydrocephalic idiocy* are forms of idiocy which are usually congenital, like genetous idiocy, although hydrocephalus, with its consequent baneful effect upon the intellectual powers, may not develop until the period of childhood.

Eclamptic, epileptic and *paralytic idiocy* belong to the acquired forms of the disease, developing in association with other disorders of the nervous system. The first variety includes those cases in which convulsions were prevalent during the dentition period, from which the child has recovered but the brain structure has not escaped permanent nutritive impairment. These cases are frequently mutes, or they are afflicted with speech impediments.

Epileptic idiocy, as the name implies, is mental deficiency, resulting directly from the presence of epilepsy. As epilepsy is one of the commonest causes of idiocy and insanity, epileptics will either manifest idiocy if the mental faculties are early impaired, or epileptic dementia if the baneful influence be delayed beyond the period of childhood.

Paralytic idiocy depends upon destruction of cerebral substance from lesions which may have developed either before birth (congenital idiocy) or after birth (acquired idiocy). In these cases there is frequently sufficient asymmetry of

the brain present to produce noticeable inequality of the skull. Hemiplegia, more or less complete, the arm usually more affected than the leg, diplegia, or simply paresis of certain muscles, and imbecility, are the accompanying conditions.

Inflammatory idiocy includes those cases following meningitis or some of the infectious fevers (post-febrile insanity) and idiocy depending upon atrophy and hypertrophy of the brain, the result of inflammatory changes.

Sclerotic idiocy presents sclerosis with atrophy of the brain, diffuse sclerotic changes, and glioma with sclerosis.—(WILMARTH.*) As predisposing causes are given the tuberculous diathesis; neuropathic heredity; alcoholism. Accidents to the mother during pregnancy and traumatism to the child's head during or after birth are exciting causes.

Syphilitic idiocy is not considered a very common form, and, when present, usually takes a downward course, placing it more closely with dementia than with idiocy. Without producing idiocy, however, syphilis not infrequently renders children backward both mentally and physically, as the phenomenon of *infantilism* so clearly demonstrates.

Traumatic idiocy results from pathological changes in the brain, induced by a destructive injury. A certain amount of inflammatory action must always be taken into consideration in these cases, but the effects of the injury predominate over those of the inflammation. Naturally, a certain degree of relationship exists between the character of an injury or the location affected and the degree of idiocy to be anticipated therefrom.

Idiocy by deprivation is that condition of mental inefficiency resulting from the absence of two or more of the special senses. In such a case the brain may be perfectly normal and the faculties unimpaired, but the unfortunate

* "Alienist and Neurologist," Oct., 1890.

deprivation of both the sense of hearing and of sight through such diseases as ophthalmia and scarlet fever occurring at an early period of childhood will result in complete mental obtuseness unless proper educational training is instituted. In some instances children have been born deaf and blind.

Deaf-mutism stands as an independent condition, the result either of an acquired deafness through scarlet fever, typhoid fever, meningitis, and otitis media, or as a congenital deafness, on account of which the child does not learn to talk. If acquired after the seventh year, the child usually escapes mutism. Acquired deaf-mutism has, therefore, no relation to idiocy, but congenital deafness is a common symptom of idiocy, simply indicating one phase of the hereditary nervous deficiency of genetous idiocy. Then, again, idiotic tendencies in a child are markedly increased by the absence of or obtuseness of any of the special senses, so that acquired deafness is a most serious calamity to befall a child of this stamp.

Cretinism; Cretinoid Idiocy, or Sporadic Cretinism.—Cretinism is an endemic condition prevalent in certain mountainous regions of Europe, especially inclosed in valleys. The abnormal mental and bodily development is associated with goitre, and cretinism is only found where goitre is prevalent. The impaired function of the thyroid is accepted as the cause for these manifestations.

The *symptoms* of cretinism are short stature; mental deficiency; loose, flabby skin; depression of the root of the nose and great distance between the eyes; obtuseness of hearing or deafness, and goitre.

Sporadic cretinism, or cretinoid idiocy, is a condition of myxœdema resulting from absence of the thyroid gland. This condition was first described by Fagge,* and numerous cases have since been published both in America and Europe.

* "Medico-Chirurgical Transactions," London, 1871.

The child may be born without a thyroid from embryonic degeneration of the same, or its degeneration may not begin until after birth. This has apparently resulted, in some instances, from an acute illness.

The first symptoms to be noted are apathetic dullness and a large, thick tongue. These signs may show themselves in early infancy or not until the child is several years old. The growth becomes stunted; the hands and feet are short and stumpy; the skin loose and wrinkled; temperature subnormal, and the ossification of the cranial bones is delayed; the head is large; fontanelles open; the nose flat and eyes widely separated; the enlarged tongue protrudes slightly from the mouth and the lips are thickened. Altogether they present a characteristic picture—a dwarfed, ugly, idiotic creature. The remarkable feature of this form of idiocy is the prompt improvement produced by thyroid treatment.

The *treatment* of idiocy in general is one of training, which cannot be entered upon here. Cretinoid idiocy is the only form in which positive results are to be expected from medicinal treatment. The *desiccated extract of thyroid gland* is administered in doses ranging from a half-grain twice daily in the beginning to one to two grains thrice daily later, in the absence of unfavorable symptoms. Relapses usually occur on discontinuing treatment.

For the various other forms of idiocy, constitutional treatment is often indicated, especially anti-tuberculous and anti-syphilitic treatment. Beside, such remedies as *baryta carb.*, *calc. phos.*, *aurum*, *kali phos.* and *sulphur* undoubtedly exert a favorable influence upon the growth and mentality of backward and imbecile children, but, unfortunately, nothing very tangible can be promised in any authentic case.

*Diseases of the Brain and Its Membranes: Acute
Leptomeningitis.*

Acute inflammation of the pia mater is a common disease during childhood, being in most instances a secondary

condition to some one of the infectious diseases, notably pneumonia, typhoid fever, scarlet fever and influenza. An unquestionable relationship seems to exist between many cases of meningitis and entero-colitis, the so-called metastasis of the latter condition to the brain, observed by our older clinicians, being explained by the possibility of infection of the meninges with pathogenic bacteria from the alimentary tract, or by the direct action upon the brain of the toxins generated there. Beside these causes, traumatism, sunstroke and acute nephritis also frequently induce a meningitis; and suppurating otitis media, erysipelas of the scalp and abscess of the brain usually have as an accompanying condition a meningeal inflammation.

The epidemic variety of meningitis, usually described as *cerebro-spinal meningitis* or *spotted fever*, from involvement of the meninges of the cord and the appearance of an exanthem during its course, is of infectious origin, the *pneumococcus* being the most frequently-found micro-organism in these cases.

The *pathological changes* observed in the brain of children dying of meningitis vary with the severity of the case and the stage at which a fatal termination took place. Frequently nothing more is found than intense hyperæmia and œdematous infiltration of the pia mater. Such cases run a rapid course, and are often overlooked as being meningitis. When, however, the onset has been more gradual and the duration longer, large flakes of fibrin and islands of purulent exudation are found covering the convexity of the brain and filling-in the convolutions, notably in the anterior lobes. This condition may be found to have extended into the spinal canal, notably over the posterior surface of the cord.

The *symptomatology* of acute leptomeningitis points to involvement of the convexity of the brain as a predominating condition. It is quite common in infants, in whom it may develop idiopathically, or in conjunction with an

entero-colitis or broncho-pneumonia. I recently saw such a case, which was undoubtedly toxic in origin, the autopsy revealing a large caseous mass in the stomach consisting of a conglomeration of bread and milk. During the course of an apparently simple gastro-enteritis this infant was suddenly seized with convulsions and rapidly-rising temperature, death resulting within twenty-four hours, from meningitis.

Infantile acute leptomeningitis may not be suspected until convulsions set in, but in many instances the child will present definite symptoms pointing to the beginning of a meningeal inflammation. Bulging of the fontanelle; malaise; elevation of temperature; irregular or contracted pupils; projectile vomiting and rigidity of the cervical muscles. As the case progresses, coma; dilated pupils; convulsions, and death or ultimate recovery, with impairment of the special senses, may ensue.

The meningitis occurring late in childhood is usually a distinctly secondary disease, with the exception of the *epidemic form of cerebro-spinal meningitis*. A secondary meningitis is naturally masked more or less by the disease which it accompanies, and if the lesions are confined solely to the convexity it is difficult of recognition, as the symptoms of stupor, delirium, convulsions, dilated pupils, irregular respiration, irregular and slow pulse and vomiting might be attributed to the original disease. Unless occurring in children over two years old, the characteristic slowing of the pulse and the Cheyne-Stokes respiration are not observed. Meningitis as a complication to another acute illness becomes a serious matter, death supervening, within a few days of its onset, in convulsions or coma, the temperature often running very high. If the process has extended posteriorly and into the spinal canal, there will be added opisthotonos; strabismus; deafness, and cutaneous hyperæsthesia.

Although the *prognosis* of meningitis is always grave,

mild cases, such as may accompany a broncho-pneumonia, an entero-colitis, or result from traumatism, are usually curable. The possibility of idiocy and permanent sensory and motor defects remaining after meningitis should not be lost sight of.

In the *diagnosis* of meningitis the only positive signs are those indicating actual compression or continued irritation of the cerebral structure, manifesting themselves as contracted, and, later, dilated, pupils; opisthotonos; coma; projectile vomiting; headache; high fever, with irregular and slow pulse, and irregular breathing and localized paralyses or convulsions. Although such symptoms as progressive prostration; elevated temperature; bulging of the fontanelle; squinting; projectile vomiting and convulsions are strongly suggestive of a meningitis, still they may all be induced by even trifling ailments which have no connection at all with meningitis, coming under the category of "teething," "reflex irritation," "worms," and the like, or marking the advent of some acute illness.

Tuberculous Meningitis ; Basilar Meningitis.

Tuberculous meningitis is often spoken of as basilar meningitis, owing to the constancy with which the tuberculous lesions develop at the base of the brain, only in exceptional cases involving the convexity, and then only as an extension of the process from the base. The opposite condition holds good in simple meningitis; but all cases of basilar meningitis are not necessarily tuberculous, some being of syphilitic origin and others a primary infectious disease existing without the presence of any inflammatory lesions elsewhere excepting an exudative process about certain tendon-sheaths. This form of meningitis is quite common in infants, and is frequently confounded with tuberculous meningitis; but, as Still* has demonstrated through care-

* "The Micro-Organism of Simple Posterior Basic Meningitis in Infants," Trans. Brit. Med. Ass., 1898.

fully-conducted autopsies and bacteriological examinations, it is probably an infectious disease, due to the diplococcus isolated by him.

Tuberculous meningitis is by no means a rare disease. It is quite common for children of the tuberculous diathesis to become thus affected, and the victims of general tuberculosis usually die of a terminal meningitis. This is especially so during infancy, while in older children the meningitis may exist as an apparently primary condition; but even here an autopsy usually reveals unsuspected tuberculous lesions of the internal viscera. Tuberculosis of the bones and lymphatics is also a strong predisposing factor to tuberculous meningitis. Heredity plays an important rôle, and in certain families the disease appears with appalling regularity. Furthermore, all conditions favoring or resulting in malnutrition offer a predisposition to the disease.

The *pathological changes* found in the brain are miliary tubercles along the course of the blood-vessels at the base of the brain; tuberculous nodules; inflammatory reaction in the membranes with the production of lymph- and pus-cells, and more or less exudation into the ventricles. The blood-vessels are injected and bathed in a sero-gelatinous exudate. In the advent of much effusion the convolutions appear flattened, but the amount of effusion and exudation seen in simple meningitis is rarely present.

Symptomatology.—For physiological reasons the symptoms will vary with the age of the child. This also modifies the clinical course of the disease to a certain extent, as tuberculous meningitis in infants is but the termination of a general tuberculosis, while in childhood it usually represents the primary condition, other tuberculous manifestations which may be present affecting only in a minor degree the health of the child.

The characteristic slowing of the pulse and the disturbed rhythm of the respiratory act are not observed until after

the second year, as the inhibitory centres are not fully developed until this time. So also, intellectual and sensory disturbances cannot be obtained until the child's brain is correspondingly developed.

A typical case pursues the following course: For a few weeks the child manifests signs of indisposition and malaise. It loses interest in its games and associates, the appetite fails, and emaciation and progressive anæmia become noticeable. There is constipation, and at times a slight elevation of temperature. As the cerebral lesions become of sufficient prominence to produce specific symptoms, headache, vomiting, and slowing of the pulse develop. They constitute the main symptoms of the first period of the actual meningitis, or the stage of cerebral irritation. Together with slowing and irregularity of the pulse there is irregularity in the respiratory rhythm, approaching the Cheyne-Stokes type of respiration.

Constipation is present from the beginning, the abdomen being flaccid, and in some instances noticeably retracted.

Vomiting is usually of the projectile type, after which the child seems weak and apathetic, gradually going into a state of stupor in the later stages.

Vasomotor disturbances present during this period are alternate flushing and paleness of the face, and the *tache cérébrale*, a broad, red line produced by drawing the fingernail across the skin of the abdomen, persisting for a few minutes, and indicating vasomotor paresis. Irregular innervation of various muscles supplied by the cranial nerves is also a common symptom of this stage. To these manifestations squinting and twitching of the facial muscles belong most prominently. The eyes are often fixed in a characteristic vacant stare.

Retraction of the head, opisthotonos, and twitching and automatic movements of extremities belong to the spasmodic manifestations of tuberculous meningitis. The most characteristic of these is the retraction of the head, which

is a strong presumptive sign of basilar meningitis, although it is frequently but a toxic disturbance.

The case now gradually goes over into the second period, that of paralysis. The duration of the first period is variable, the average being from ten days to two weeks. Its course is also irregular, unexpected signs of improvement frequently showing themselves, from which the child soon relapses back into its original state.

The second period is characterized by progressively increasing stupor; increased frequency of the pulse and failing heart; dilatation of the pupils; opisthotonos with general relaxation of the muscles of the extremities in which transient convulsive movements may be noted; complete coma and death. Although the temperature is not high during the course of the disease, unless an associated tuberculous process renders such the case, there is a rapid rise shortly before death, which may attain to a degree of hyperpyrexia. Death in convulsions is not common. The average course is from two to three weeks, not including prodromal symptoms.

The *prognosis* is always unfavorable. I have seen apparently well authenticated cases recover, but I doubt if they will be spared a relapse or a death from general tuberculosis at some later period, if they were really tuberculous. Unfortunately, an absolutely positive diagnosis cannot be made, which always leaves room for doubt in those cases showing complete recovery. The toxic cerebral symptoms developing during a pneumonia in childhood so closely resemble tuberculous meningitis in many of its phases that it really becomes difficult at times to estimate their true significance. They are certainly within the reach of our remedies, as I have repeatedly satisfied myself, but the remedies which control them fall short in the true tuberculous process.

The *diagnosis* of tuberculous meningitis is based upon its gradual onset, the presence of the tuberculous diathesis or

tuberculous family history, and the development of the characteristic symptoms of the first period, namely, constipation, headache, slowing of the pulse, vomiting, and drowsiness, being strong presumptive evidence that the disease exists. *Gastric catarrh* must be excluded, and in the presence of fever, *typhoid* fever is to be thought of.

Simple meningitis is differentiated by its rapid onset and acute course; *cerebral hyperæmia* by its transitory nature, and *hydrocephaloid* by its association with diarrhœal or other exhausting diseases. The last-named condition is described in another chapter.*

Treatment.—The general management of cases of acute leptomeningitis and tuberculous meningitis differs somewhat, owing to their clinical diversity. Leptomeningitis runs an acute course and frequently exists as a complication of another acute illness, for which reason it becomes more difficult to manage than the subacute tuberculous type. Hyperpyrexia may be present, necessitating frequent sponging, and the occurrence of convulsions calls for a warm bath in infants or a warm pack in older children. Should they manifest a tendency to recur or become persistent, a hot mustard pack is more efficient. Stimulation may become necessary in the later stages, and no effort should be spared to save such cases, as they are not infrequently curable. The ice-cap is recommended by some, but I doubt its efficacy.

In tuberculous meningitis, prophylaxis offers the only promising results. Outside of a low diet, attempts at keeping the bowels open by means of enemata and the employment of simple dietetic measures, beside stimulation when indicated, there is little to be done with the exception of what medicines may accomplish.

Acon. may be indicated early in primary cases of leptomeningitis.

Apis.—This is one of the most important remedies in meningitis, both the subjective symptoms, as well as the

* "Diseases of the Intestines," p. 107.

pathological tendency of the drug, indicating it in many instances. Particularly characteristic of *apis* is the shrill, piercing cry, which is usually heard at night, while the child is asleep or in a soporose condition. Other prominent symptoms are difficulty in swallowing; retraction and rolling of head; strabismus and dilated pupils; gritting of the teeth; suppressed urine; convulsions and coma. The amount of effusion is usually considerable in cases calling for *apis*.

Arnica is recommended in traumatic cases.

Belladonna presents a true picture of the early stages of a meningitis, at which time cerebral hyperæmia is the most prominent condition. It is of little use after effusion and exudation have taken place. The face is flushed; eyes bright with dilated pupils; there is pronounced hyperæsthesia of the senses with frequent starting, especially on attempting to go to sleep; the pulse is full and bounding, the fontanelle prominent, and general convulsions set in.

Bryonia corresponds to the exudation stage. Fever with great thirst, and dryness of the skin and mucous membranes; irritability of temper with marked indifference and desire to remain quiet; prostration; constipation; bursting headache; face dark red; head retracted; constant chewing motion of mouth.

Cicuta.—For the irritative stage of meningitis *cicuta* is a most valuable remedy, particularly when there are general convulsions, beginning as twitching in the fingers, followed by complete unconsciousness. There is rolling of the head; fixation of the eyes; boring of the occiput into the pillow. The child is greatly agitated, grasping at its mother in a frightened manner when being taken up. *Cicuta* controls the amount of effusion to a marked extent.

Cuprum.—Especially useful during the exanthemata, after recession of the eruption. (*Zincum*, “not able to develop exanthemata.”) The *acetate of copper* was first recom-

mended by Dr. George Schmid, of Vienna, for the cerebral symptoms resulting from the retrocession of any of the acute exanthemata, or from difficult dentition, in cases not active enough for *belladonna*.—(HUGHES.*)

Gelsemium may be indicated upon its well-known symptoms of drowsiness; paralysis of the muscles of the eye; convulsive movements during sleep; intense headache and low form of fever.

Glonoin.—Intense cerebral congestion; throbbing carotids; high arterial tension; high fever, with paleness of face or intense redness. *Veratrum viride* is indicated in similar cases, where the symptoms are intense. *Glonoin* suits most particularly the form of meningitis developing after sunstroke.

Helleborus.—Exudative stage. Great irritability; eyes rolling from side to side; wrinkling of the folds of the forehead, as if frowning; chewing motion of the mouth; boring the head into pillow; cervical opisthotonos; automatic movements of one or more of the extremities with jerking and twitching of groups of muscles; scanty, dark-colored urine with sediment like coffee-grounds.

Mercurius.—Intense headache, as if compressed by tight band. The child is drowsy, cries out in its sleep and tosses about restlessly. There may be a clammy offensive sweat; foul odor from mouth; thickly-coated and swollen tongue. *Mercury* is one of the most useful absorbents to remove the inflammatory exudate.

Opium.—Sopor; pupils contracted or immovably fixed, with glassy, half-closed eyes and pale face; stertorous breathing.

Stramonium.—Violent delirium; face red and bloated, with wild expression of eyes; automatic movements of hands and feet, convulsions and coma. Child awakens from sleep screaming and terrified.

* "Pharmacodynamics."

Sulphur.—On account of its pronounced absorptive action *sulphur* is frequently indicated in the later stages of meningitis, especially when the case comes to a standstill. Many of its characteristic symptoms are frequently present in these cases, but even without such, the above condition fully justifies its use.

Zincum.—Continuous movement of the lower extremities, particularly the feet; profound nervous depression; abolition of reflex action; meningitis developing with the exanthemata or during an epidemic of such, when the rash recedes or does not make its appearance.

In tuberculous meningitis *iodoform*, *lycopodium*, *calc. carb.*, *calc. phos.*, *spongia*, *apis* and *sulphur* seem most applicable. The alleged efficacy of *iodoform* has attracted considerable attention of late. Several cases have been reported cured both by the internal administration of the drug in the 2x to 6x trit. and by the use of an *iodoform* salve as an inunction, after shaving the scalp.* I have in several instances relieved meningeal symptoms accompanied by retraction of the head, occurring during the course of acute pulmonary affections, and in one case in a syphilitic infant, with this drug, but they were most probably of toxic origin. The provings of *iodoform* contain many symptoms strongly suggesting its use in meningitis.†

Lycopodium is well adapted to many cases coming on insidiously in strumous children. Goodno‡ reports such a case cured by *lyc.*, 6x.

Spongia is of great importance on account of its relationship to scrofulosis and tuberculosis.—(HERING.) Its chemical composition would suggest a similarity with *iodoform*.

Convulsive Affections.

Eclampsia, or Infantile Convulsions.—General convulsions occur in infancy from a variety of causes, and are among

* Bailey, "Medical Counselor," June, 1898.

† See "Cyclopædia of Drug Pathogenesis," vol. iii.

‡ "Practice of Medicine."

the more frequent of the nervous disorders incident to this period of life. In many respects these seizures bear great resemblance to idiopathic epilepsy, but the latter condition is not seen in early childhood, nor does it run the same clinical course nor depend upon the same etiological factors as infantile convulsions. Eclampsia may be looked upon as an explosive discharge of nerve force in the motor areas, brought about by a condition capable of suspending momentarily the normal controlling influence of the higher inhibitory centres. Such a factor is most frequently found in reflex irritations, *i.e.*, sensory impulses originating in various parts of the body by being carried to the cerebrum along the afferent nerve fibres, transiently disturbing the controlling element in these centres.

Although infancy of itself predisposes to convulsions by reason of the rapid growth of the brain and the instability of the nerve centres, still a healthy and properly cared for child rarely develops them. There is usually some constitutional disturbance, or a general disease affecting directly the nutrition of the nervous system. For this reason rickets plays such a prominent rôle as a predisposing cause.

Among the exciting causes, *reflex irritation* may be mentioned as a frequent factor in the production of general convulsions. It requires, however, a high degree of susceptibility of the nervous system, depending upon the causes already mentioned, in order to precipitate a convulsion through reflex irritation alone. In this category difficult dentition; phimosis; the presence of undigested food-particles or foreign bodies in the alimentary tract; worms (less frequently, owing to the rare occurrence of helminthiasis in infancy), and retention of urine are to be classed. It is often difficult to say whether convulsions resulting from the presence of undigested food in the alimentary tract are the result of reflex irritation or of auto-intoxication, the latter condition being presumably the most fre-

quent explanation from the severity of the symptoms observed in many of these cases; nevertheless, the indications for treatment are the same in either case.

Toxic Causes.—To this class belong the convulsions ushering in the infectious fevers, or resulting from auto-intoxication, uræmia, asphyxia, etc. Lastly are to be mentioned the convulsions resulting from *direct cortical irritation* and occurring in meningitis; cerebral hæmorrhage, abscess or thrombosis; hydrocephalus; brain tumor, etc.

The anatomical lesions found in children dying in convulsions are by no means constant or characteristic. The changes occurring in the brain are probably anæmic, followed by venous hyperæmia. When intense congestion, serous effusion and punctate hæmorrhages are found after death they are to be looked upon as a result of the convulsion and not as a cause of the same, death having resulted from asphyxia. The initial stage of a meningitis may also be found; or, if the convulsion depends upon organic brain disease, such a condition at once presents itself.

Symptomatology.—Infantile convulsions are most frequently general, although a localized or partial convulsion may result as well from reflex irritation as from organic disease. In such cases the subsequent course of the disease alone will clear up the mystery, if unmistakable evidence of organic disease or reflex irritation cannot be elicited at the first examination of the case. Even a more extensive convulsion shows a tendency to begin in one extremity a few seconds before it passes to the remaining half of the body or becomes general; but the true local convulsion, or *Jacksonian epilepsy*, repeatedly commences in one extremity, and if it does not remain local, at least continues so for an appreciable time.—(HERTER.*) This form of convulsion is indicative of organic disease, the nervous discharge commencing at the seat of irritation. Prodromal

* “Diagnosis of Diseases of the Nervous System.”

symptoms are therefore usually present, indicating the commencement of a general convulsion. They may be so slight as to be entirely overlooked, or they may be quite manifest as extreme restlessness, twitching of the mouth, eyelids, extremities, and rolling of the eyes.

The convulsion proper is very similar to an epileptic fit. The child becomes suddenly rigid, the neck being thrown back, the hands clenched, with thumbs buried in the palms, and the extremities stiffen out. This stage is only of short duration, not as long as in a true epileptic attack, while the succeeding stage, consisting of intermittent spasmodic contractions of the extremities, is comparatively longer. During this stage the entire body is seen in alternate rhythmical contraction and relaxation. The child is perfectly unconscious, and may involuntarily pass both urine and fæces. In the course of a few minutes to half an hour, according to the gravity of the case, these spasms gradually subside, leaving the child in a soporous condition. It is not uncommon for several convulsions to occur in succession, as repeated convulsive seizures create a susceptibility from which the nervous system regains itself with difficulty.

The *prognosis* depends upon the nature of the exciting cause and the course pursued by the seizure. Where convulsions recur in rapid succession, or when associated with laryngismus stridulus, the prognosis becomes grave. Likewise in convulsions occurring with uræmia or with meningitis, extensive hæmorrhage, or other serious intra cranial lesion, the prognosis is grave. Should the convulsive habit become firmly established the child is quite likely to develop idiopathic epilepsy.

Diagnosis.—The differentiation of symptomatic from idiopathic eclampsia rests upon a proper examination of the patient for evidence of disease elsewhere. Thus, with convulsions ushering in the infectious fevers, there are always the symptoms belonging to the stage of invasion of

the particular fever in question. In uræmic convulsions the urine tells the tale. Those due to reflex irritation give evidence of such a source of irritation, and a purely rachitic case becomes self-evident by inspecting the child closely. Intra-cranial disturbances are recognized by characteristic symptoms present before the convulsions have made their appearance.

Convulsions occurring shortly after birth are usually due to meningeal hæmorrhage. Unilateral spasms are liable to occur later from cortical hæmorrhage, as a result of whooping-cough, trauma or idiopathic origin.

Epilepsy is to be suspected when repeated convulsive seizures occur in children above three years of age, notwithstanding the absence of any source of reflex irritation or other causes to account for these attacks. Other symptoms, such as an aura and stigmata of degeneration, are usually ascertainable.

Treatment.—All exciting causes must be removed at once when this is possible, and the predisposing cause is to be overcome by attending to the child's general condition. Constitutional remedies and a properly-selected diet, together with plenty of fresh air and sunshine, are indispensable here. (See *Rickets*.)

As gastro-intestinal irritation plays such an important rôle in the precipitation of convulsive seizures, the stomach and bowels should at once be emptied when the attack is suspected to arise from this source.

During the seizure every article of clothing should be loosened. If the convulsion lasts for any considerable length of time a warm bath, together with cold applications to the head, is indicated. In long-continued or recurring convulsions a hot pack or a weak mustard pack is more practicable.

The most frequently indicated remedies are *belladonna*, *cuprum*, *cicuta*, *ignatia* and *magnesia phos.*, basing our prescription purely upon the occurrence of convulsions. When,

however, the convulsion is purely symptomatic, the results of treatment will be more satisfactory if we direct our attention to the exciting cause instead of looking upon the convulsion as the disease itself.

Acon.—High fever; high arterial tension; great restlessness. Febrile cases.

Bell.—Convulsions, with flushed face; dilated pupils; cerebral congestion; throbbing carotids; pyrexia. Indicated in those cases ushering in the infectious fevers, in some reflex convulsions, and in convulsions occurring in the early stages of meningitis.

Cuprum.—Convulsions beginning in the fingers and toes, becoming general, with marked cyanosis. Spasm of the glottis is associated with these cases. Convulsions occurring during the eruptive fever when the rash disappears; whooping-cough; meningitis (*cupr. acet.*).

Cuprum ars. is most valuable in uræmic convulsions.

Cina.—Reflex convulsions from irritation of the intestinal tract, whether due to worms or not. The spasmodic movements are often confined to the eyes and face, continued with irregular jerkings of the extremities. In this respect it is similar to *chamomilla*, which presents many of the premonitory symptoms of eclampsia, the child being feverish, irritable, and suffering with intestinal colic or painful teething. In such cases *chamomilla* will frequently ward off a convulsion.

Cicuta.—The convulsion comes on suddenly without premonitory signs. The stage of tonic spasm is well marked, and the child may remain rigid for a long time, only a few jerks of the extremities being noticed during the attack. It usually points to cerebral effusion.

Ignatia.—Convulsions in nervous subjects brought on by fright or peripheral irritation. The vascular excitement of *belladonna* is not present in these cases, and the face is inclined to be pale instead of hot and flushed, as in the latter remedy.

Magnesia phos.—Idiopathic convulsions; defective nutrition of the nervous system. (See *Epilepsy*.)

Opium.—Convulsions in cerebral hæmorrhage. There is trembling of the whole body; purplish color of face; stertorous breathing and sopor; post-epileptic stupor.

Veratrum viride.—Great vascular excitement with high arterial tension; opisthotonos; eyes injected and staring; intense cerebral congestion.

Beside these remedies compare also *apis*, *calc. carb.*, *gels.*, *helleb.*, *hyos.*, *stram.*, *ippecac.*, *sulph.* and *zincum*, and consult the article upon *Meningitis* and *Laryngismus Stridulus*.

Epilepsy.

Idiopathic epilepsy presents a condition in which recurring attacks of unconsciousness with convulsions (*grand mal*) or without convulsions (*petit mal*) are firmly established, ultimately leading to an impairment of the subject's mentality.

Etiology.—Heredity plays a most important rôle in the etiology of epilepsy, the tendency springing not only from the presence of epilepsy, but also of other nervous diseases, such as hysteria, neurasthenia and insanity in the family history. Parental syphilis and alcoholism are also looked upon as causes. As to age, the period of puberty furnishes the majority of cases. It only rarely develops before the third year. Sachs* is of the opinion that hereditary (idiopathic) epilepsy is not as common as is generally supposed, many cases being accepted as such because a former cerebral lesion or a traumatism to the head has been overlooked owing to the disappearance of the paralysis and other symptoms due to such a lesion, from which, however, the epilepsy dates. To this category also belong those cases of epilepsy associated with infantile cerebral palsies and defective general development of the brain.

* "The Nervous Diseases of Children."

The *exciting cause* of the seizure is most frequently found in disturbances of the digestive tract. Acute indigestion, either through reflex irritation or auto-intoxication, will almost invariably precipitate an attack. Reflex irritation from phimosis, eye-strain, worms, etc., exerts a similar influence. Emotional excitement, excessive physical exertion, and poorly ventilated or crowded apartments are also disadvantageous to the epileptic.

Symptomatology.—An attack of *petit mal* is characterized by a momentary loss of consciousness, unaccompanied by convulsions or other nervous phenomena. In children it is often looked upon as mere absent-mindedness or a fainting spell; in older subjects it is more liable to be confounded with vertigo, with which, it is unnecessary to say, it has nothing in common. After this condition has once been fully established, a change in the child's mentality becomes manifest; it may go over into the convulsive form or exist in conjunction with the same.

An attack of *grand mal* is very similar to an attack of infantile convulsions; but other conditions are added thereto, and the various stages are more sharply defined and characteristic. The following stages are to be observed:

(1) The *aura* or *prodromal* symptoms. This usually consists of a sensory disturbance, which may be variously described as a tingling; feeling of numbness; crawling; sensation of a gust of wind directed upon the affected part; hallucinations of sight, smell and hearing. There may also be motor disturbances, and the character of the aura will in many instances point to involvement of a special area of the cerebral cortex.

(2) The *initial cry*. This marks the commencement of the stage of tonic spasm. The patient utters a loud cry, as a result of the spasmodic contraction of the respiratory muscles forcing the air through the partially closed glottis, whereupon he falls to the ground as if shot. With this stage, unconsciousness also sets in.

(3) The *tonic spasm*. During this stage the body is perfectly rigid, the legs extended, the arms flexed and the hands clenched, the thumbs being pressed into the palms of the hands by the fingers. The head may be retracted, causing opisthotonos (young children), or it may be drawn to one side, the eyes being fixed in pointing in the same direction. The pupils are immovably dilated. The face, at first pale, now becomes reddened, and even cyanotic if the stage is prolonged. The jaws are set, and the tongue is frequently caught between the teeth. The stage of tonic spasm lasts for a period of about a minute, at the end of which time it gradually subsides, being followed by—

(4) The stage of *clonic spasm*. This consists of alternate relaxation and contraction of the muscles of the extremities and thorax, persisting for several minutes (seldom over five minutes). Through these movements the body is thrown into violent action, and frothy saliva is ejected from the mouth, the tongue quite frequently being caught between the teeth and badly bitten. Urine and fæces are frequently passed involuntarily. The movements gradually subside, and the patient goes over into—

(5) The stage of *stupor*. Post-epileptic stupor is a profound sleep from which the patient may be temporarily aroused, but soon relapses into unconsciousness. This may last for several hours.

Prognosis.—Cases of epilepsy coming under treatment early, providing there is no organic lesion or mental deficiency associated with the same, should not be despaired of as incurable. Traumatic epilepsy is frequently cured by early surgical interference. Hereditary cases offer a bad prognosis, as they usually present degenerative tendencies. “More favorable are those cases which come on during the period of dentition, or are caused by disturbances in the nutritive functions, such as chlorosis or anæmia; in fact, in all cases where it is possible to remove the cause.”—(C. G. R.) From this it will be seen why the best results

in treatment are obtained by attending strictly to the patient's diet and hygienic surroundings, and by prescribing upon constitutional and general indications rather than upon the convulsive symptoms.

Diagnosis.—*Eclampsia*: Prior to the age of three years; longer duration; reflex irritation or organic disease ascertainable. The convulsions are liable to recur after a short time, while in epilepsy a long interval is usually present.—(BARTLETT.)

Hysteroid convulsions are usually precipitated by emotional excitement; rigidity is marked, followed by irregular movements of the extremities; the duration is much longer than an epileptic seizure, and there is no biting of the tongue or involuntary micturition and defecation.—(GOWERS.)

Other conditions to be thought of are *uræmic* and other *toxic convulsions*, and, in the case of *petit mal*, *syncope* and *vertigo* must be excluded.

Treatment.—All sources of reflex irritation, such as phimosis, cicatrices, errors of refraction and nasal defects must be corrected at once. The diet is of great importance. The patient should be kept mainly on a vegetable diet, allowing milk regularly, and poultry and fish only occasionally; furthermore, the stomach must never be overloaded, and, beside prohibiting meat, all indigestible articles of food, such as pastry, rich desserts, etc., must be strictly avoided.—(BARTLETT.)

In cases of malnutrition, meat may occasionally be allowed, but a liberal meat diet is always bad in children. Cases in which convulsions had ceased under an exclusive vegetable and milk diet invariably relapsed when meat was allowed, no change in the medicinal treatment having been made.—(THOMPSON.*) Cod-liver oil is indicated in the rachitic and strumous.

* "Practical Dietetics."

Excessive physical exertion must be avoided, while judicious out-of-door exercise proves of the greatest benefit.

During an attack the patient should be protected from doing himself injury. A towel or other available article may be inserted between the teeth to prevent biting the tongue, and the clothing should immediately be loosened. The inhalation of *amyl nitrite* sometimes shortens the attack.

As before stated, the best results are obtained from remedies selected upon general indications, taking into consideration the patient's peculiar mental, temperamental and diathetic peculiarities; also any disturbances in the alimentary, respiratory, genito-urinary tract, etc. For this reason such remedies as *cicuta*, *hydrocyanic acid*, *œnanthe crocata* and *solanum* are rarely of positive value. On the other hand, *argentum nitr.*, *calc. c.*, *lycop.*, *nux vom.*, *pulsatilla*, *sil.* and *sulphur* are of the greatest service. There are, however, a series of convulsive remedies which are among the most potent anti-epileptics, but their action, as at once seen from a study of their pathogenesis, is a deep, selective one, directed to various organs and tissues, not simply inducing transient functional disturbances. I refer mainly to *cuprum* and *magnesia phos.* *Magnesia phos.* has given me positive results in cases of idiopathic epilepsy in so far that it greatly reduced the frequency of the paroxysms and lessened their severity; but as they were mostly dispensary and hospital cases, they were not observed for a sufficient length of time to judge of any permanent results. The prompt action obtained from this remedy in a case of *tetany* of long standing certainly points to its efficacy as an antispasmodic of great value.

Where disorders of the digestive tract and lithæmic symptoms are prominent conditions, *nux vom.*, *lycopodium*, *bry.*, *puls.*, *sepia* and *indigo* are indispensable. The latter remedy I have seen yield most gratifying results in cases marked by an extreme degree of depression of spirits.

It is a noteworthy fact that *indican* is found in the urine of many epileptics just about the time of the seizure (HERTER), being formed in the intestines from excessive putrefaction of proteids. This points to the necessity of preventing intestinal putrefaction. One of the most useful remedies to overcome this process is *lachesis*; it promptly corrects the exceedingly offensive stools, whether they be formed or loose, thereby lessening the frequency of the attacks and improving the patient's general condition greatly. Such patients are usually anæmic, and suffer from palpitation, dyspnœa, and other reflex disturbances.

The following *résumé* is given in order to call attention to the guiding indications for the important remedies:

Arnica.—Recent traumatic cases.

Arg. nitr.—Old-looking expression; pupils dilated before paroxysm for a day or two; flatulent dyspepsia, with cardiac palpitation; apprehensiveness and depression of spirits; attacks of hemicrania; periodic trembling of body and paralytic weakness; epilepsy from fright; masturbation; menstrual difficulties.

Arsen.—Anæmic, weakly subjects. Burning in the spine; burning in the stomach and bowels after eating; diarrhœa, with smarting about anus. *Petit mal*.

Bell.—Violent convulsions, with marked cerebral congestion; mania. Prodromal symptoms consist of flushing of the face; throbbing of the carotids; wild, staring expression; feeling of suffocation. During the interval throbbing headache; vertigo; flushing of the face, with burning heat; easily frightened; night terrors; enuresis. *Stramonium* is similar in many respects. Symptoms brought on by fright, with great nervous excitement; spasmodic constriction of the throat; gyratory movements of extremities and threatened convulsions. *Stramonium* is frequently of service when *belladonna* has failed to give relief, or its chances for doing good have slipped by, as it is of no service in old cases. The cases in which *hyoscyamus* has

proven so beneficial are undoubtedly hysteroid in nature, as Jahr intimates. Such causes as "disappointed love, jealousy and grief," mentioned under the etiology of *hyoscyamus*, point to the hysterical element in these attacks, as also such symptoms as "attempts at swallowing fluids renew the attacks," and "inclined to talk a great deal after the attacks; slight wandering of the mind."

Bufo.—Bojanus* reported a series of twenty-two cured cases of epilepsy, among which four were cured by the use of *bufo* alone, three with *bufo* followed by *salamander*, and two with *bufo* in conjunction with *lachesis* and *ignatia*. He gives no special indications for this remedy. "After fright or onanism; attacks at night, followed by some hours of coma; loss of consciousness and falling down; tonic and clonic spasms; turgescence and distortion of face; bites tongue; involuntary emission of urine; the lower extremities are more in motion than the upper ones."—(C. G. R.)

Calc. carb.—Scrofulous diathesis and leucophlegmatic temperament. Anæmia; catarrhal and cutaneous affections; prominent belly; cold hands and cold, sweaty feet; sweating about the head. "Frequently indicated after *sulphur*," or in conjunction with *belladonna*.

Causticum.—Where the mind is affected and paralytic affections are associated with the epilepsy. Degenerative changes in the nervous system. Paralytic weakness after the seizure is marked. A drink of cold water is said to prevent the attack, while, under *calc. c.* and *hyos.*, the same is aggravated. Cases caused by fright (also *ignatia*, *hyos.* and *stram.*); nocturnal epilepsy (also *cupr.*, *calc. c.*, *opium* and *lycop.*), and those following suppression of eruptions (*ars.*, *cupr.*, *calc. c.* and *sulph.*).

Cicuta.—Violent epileptiform spasms, accompanied by puffed, bluish face; fixed, staring eyes; terminating in

"Die Hom. Therapeutik in ihrer Anwendung auf die Operat. Chirurg.," 1880.

trembling and long-continued sopor. Intestinal irritation, with venous congestion of abdomen.

Cimicifuga rac.—Epilepsy associated with disturbances in the female generative organs.

Cuprum.—Clear, idiopathic cases without organic lesions. The attacks may have been precipitated by fright, mental excitement, or suppressed exanthemata. The attack is typical, and cyanosis is usually marked.

Gels.—Dull occipital headache before attack; languor; drooping of eyelids; easily frightened into diarrhœa; prolonged spasm of the glottis during attack.

Glonoin.—"Great congestion of head and right heart; during spasm he spreads his fingers and toes asunder."—(C. G. R.)

Hypericum.—After injury to the spine or peripheral nerves.

Ignatia.—This remedy is especially suited to ordinary cases of epilepsy in children. They are exceedingly nervous and easily frightened, irritable and peevish, and difficult to control. Jahr considered it the most valuable remedy with which to begin a case.

Nux vom.—Bilious temperament; constipation, tongue coated posteriorly, bad taste, headache on rising in morning, with irritability (*lycop.*, great irritability after sleep) and anorexia, especially mornings. *Nux vom.* and *lycop.* are very important general remedies for the epileptic.

Opium.—Prolonged post-epileptic stupor. Nocturnal cases, with mental derangements.

Silicea.—Lack of animal heat; strumous and rachitic diathesis; neurasthenia; pale transparent skin; profuse sweat after the seizure. They are said to occur most frequently at the time of the new moon.

Sulphur.—Scrofulous or psoric individuals. It is unnecessary to describe the characteristic *sulphur* child here. *Sulphur* is also important as an intercurrent, or in cases not responding to the usual list of remedies.

The bromides.—When, after careful study and conscientious efforts to control a case of epilepsy by means of a remedy chosen purely symptomatically in conjunction with faithfully carried out hygienic measures, the seizures still persist and recur with alarming frequency, whereby the patient's general condition and mental state are profoundly affected, it becomes imperative to control the convulsions by physiological means. Not that the use of the *bromides* is entirely unattended by unfavorable results, but these are comparatively mild and easily removed when compared to the undermining influence of oft-repeated convulsions upon the nervous system. Having a limited experience in the use of these remedies, I cannot do better than quote from the leading old-school authorities in neurology:

“It is certain that very few cases have been permanently cured by the administration of *bromides*; but unquestionably they serve an admirable purpose in checking the number of attacks and in diminishing their severity. To accomplish this end the *bromide salts* should be administered according to a definite plan. It has been my practice to give preference to the *bromide of sodium*, which I employ, according to the age of the patient, in ten or fifteen-grain doses, three times a day. If given in a wineglassful of (alkaline) water after meals the gastric functions will not be seriously impaired. . . . In the case of nocturnal attacks the medicine should be given before going to bed [the entire daily dose], and at no other time.”—(SACHS.*) The method recommended by Seguin† has many followers. It consists in the administration of the larger part of the full daily dose shortly before the time when a seizure is to be expected. During the interval a much smaller dose is employed, and the *salt* is always given highly diluted.

As soon as the paroxysms are controlled the dose is decreased to a minimum, but the remedy should not be immediately withdrawn.

* “Nervous Diseases of Children.”

† “New York Med. Jour.,” March, 1890.

Tetany.

Tetany is a neurosis characterized by tonic spasms, occurring principally in the extremities. The spasm may remain confined to these parts or it may extend to other groups of muscles, thus involving the neck, trunk, thorax and abdomen. Strabismus and trismus may likewise be present, but they occur secondarily to the spasm of the extremities, contrary to the occurrence of trismus in lockjaw, when it is the primary manifestation. The spasms are also intermitting in character, seldom persisting longer than a few hours.

Etiology.—The close association of tetany with laryngismus stridulus and rickets points to a general disturbance in the nutrition of the nervous system as the cause inviting these phenomena. The tetanic spasms can be explained upon the theory of an increased excitability of the gray matter of the brain, medulla and cord, resulting from the above mentioned cause. An infectious origin is believed in by some. The disease is rare, especially in this country, and the majority of cases have been observed between the ages of one and five, males being more frequently affected than females. As exciting causes, intestinal irritation, persistent diarrhœa; teething; phimosis; exposure to cold, and exhausting acute illnesses, such as typhoid fever and pneumonia, stand most prominently, especially when they become active in rachitic and debilitated subjects. Extirpation of the thyroid gland has frequently been followed by tetany.

Symptomatology.—Children who are old enough to express their feelings may complain of a tingling or numbness in the extremities preceding the attack. The spasm comes on suddenly, involving first the fingers and wrists, after which the toes and ankle-joints become fixed in a characteristic attitude. This is described as the “carpopedal spasm.” The fingers are straightened out and flexed at the metacarpal-phalangeal joints, while the wrists are

likewise flexed and the thumb drawn in under the fingers. The feet are in a position of talipes equinus, with the toes extended and flexed at the metatarso-phalangeal joints. As stated above, the spasm may extend to other groups of muscles, causing opisthotonos, trismus, strabismus or dyspnoea, according to the locality affected. A cramp-like pain may be complained of in the muscles, and any attempts to extend the extremities or to place the child on its feet causes a painful strain upon them. After a variable period the spasm relaxes and an interval of several hours or days occurs. In particularly aggravated cases, however, the child does not appear entirely free from the spasmodic condition, evidence of slight rigidity and weakness of the affected muscles being present. Pressure upon the large nerve trunks and arteries of the extremities affected during the spasm will invariably bring on an attack. This sign is known as "Trousseau's symptom." Such children are usually unable to walk or feed themselves, owing to the spastic condition of the muscles and the readiness with which attacks are brought on by these attempts.

The *duration* has been variously given as from several weeks to several days. In this respect it is similar to chorea, many cases promptly recovering, while others practically show the choreic tendency or its after-effects throughout life. The *prognosis* is good, being favorable as far as danger to life is concerned unless the attacks are accompanied by spasm of the glottis or general convulsions, or pronounced spasm of the respiratory muscles.

Diagnosis.—The primary corpo-pedal spasm with secondary involvement of other muscles; the intermittent character of the attacks; the absence of cerebral symptoms or loss of consciousness; Trousseau's symptom, and the increased irritability of the nerves. Together with the etiological factors are clinical data which will readily serve to distinguish tetany from other diseases of a spasmodic type.

Treatment.—The constitutional condition must be corrected by an appropriate diet and hygiene, as directed for *Rickets*. Remedies useful in this condition may likewise be of benefit to the case. According to Bartlett there is no homœopathic literature upon the subject, and he recommends *nux vomica* and *secale* as suggesting themselves symptomatically. A case of long standing coming under my care at the Children's Homœopathic Hospital was promptly relieved by *magnesia phosphorica*, 3x trit., so that it was able to feed itself and walk. The cure could not be attributed to nursing alone, as it had come from other institutions. The child was dismissed cured, but the subsequent history could, unfortunately, not be ascertained.

Affections with Motor Disturbances: Chorea.

Chorea, or St. Vitus' dance, is one of the commonest of nervous diseases of childhood. It is a neurosis characterized by irregular, useless, involuntary muscular contractions in various parts of the body, usually of wide distribution, and associated with a loss of muscular tone and disturbed co-ordination of voluntary movements.

Etiology.—Rheumatism is to be looked upon as the most constantly present and most positively known cause for chorea, although the disease is precipitated by fright perhaps more frequently than by any other known cause. The former condition furnishes the necessary disturbing element in the child's economy capable of exerting a specific influence upon the central nervous system, while the latter acts as an inciting cause by rendering the nervous system temporarily more receptive to the action of the rheumatic virus. This strong causative relationship existing between chorea and rheumatism is denied by some neurologists, owing to the fact that in only a small percentage of cases of chorea are we able to ascertain a history of acute rheumatism preceding the same; but this objection can only result from an improper conception of rheumatism

in children, which is seldom articular at this age, and assumes quite a different type from that observed in adults. Endocarditis is frequently the only symptom of acute rheumatism in children, and its frequent association with chorea is well established. A rheumatic family history is also closely associated with chorea. In the cases in which I was unable to ascertain definite symptoms of rheumatism in the child, there was almost invariably a strong evidence of the disease in the parents or in other members of the family. From this it would seem that a common toxic agent exists which is capable of giving rise to choreic manifestations if it affects principally the cerebral cortex, and rheumatic manifestations if the articulations and serous membranes are attacked—an explanation advanced by Hirt and others. Indeed, we may observe both the manifestations of chorea and rheumatism to a marked degree in certain severe cases of rheumatic fever, and the appearance of choreic symptoms in such cases offers a grave prognosis, as they indicate a high grade of toxæmia.

A neuropathic family history is found in a large percentage of cases, and epilepsy, insanity or alcoholism in the parents are undoubtedly potent predisposing causes to chorea. In this respect sex also plays an important rôle, as girls are far more frequently affected than males. The largest number of cases are seen between the ages of seven to twelve; before the fifth year it is quite rare, and after puberty it usually disappears spontaneously, although cases have been observed in adults. These must not, however, be confounded with Huntingdon's chorea, which is a hereditary disease developing between the thirtieth and fortieth year, and presenting a most unfavorable prognosis.

The *pathology* of chorea is still obscure. As the action of the toxins upon the cerebral hemispheres would in all probability excite only vascular and nutritional changes, they are difficult. The frequency of unilateral disturbances

early in the course of chorea, the cessation of symptoms during sleep, the blunting of the mental faculties and the occasional psychic disturbances observed, indicate that the gray matter of the cerebral cortex is pre-eminently affected. Organic changes in the structure of the brain may lead to the development of choreiform movements, especially lesions following a cortical hæmorrhage. The term "*post-hemiplegic chorea*" has been applied to these cases, but the movements are, more strictly speaking, athetoid in character, usually unilateral, not ceasing during sleep, and associated with rigidity and other evidences of organic disease.

The presence of capillary emboli in the brain (corpora striata) was seriously looked upon as the specific lesion in chorea, but this occurrence has been shown to be purely accidental, resulting from a complicating endocarditis, and by no means an essential element in the disease.

Symptomatology.—The onset may be sudden or gradual. A severe fright may be followed within the course of a few hours or a day by evidences of extreme restlessness and a disposition to jerk and twitch in various parts. Ludicrous grimaces may be executed, and the child is unable to remain seated quietly in one position for any length of time. The arms are thrown into continuous irregular action and the legs crossed or shifted from one place to another. Voluntary actions are executed with difficulty, being characterized by extreme awkwardness and futility of purpose; the extremities become weak, so that the child drops every article from its hands and stands in a relaxed, swaying position, readily stumbling or tiring out, while speech may become so indistinct and muffled from involvement of the tongue and muscles controlling the larynx (*laryngeal chorea*) as to render it most difficult of interpretation.

A more gradual result is seen in those cases resulting from over-pressure at school, anæmia following acute illness, or any of the slower-acting exciting causes. The

child gives indications of gradually-increasing restlessness and awkwardness, the first condition resulting from the occurrence of involuntary muscular contractions, while the latter indicates disturbed co-ordination from the association of involuntary muscular contractions with all voluntary efforts. These phenomena may begin in one extremity or as a unilateral affection, first showing itself as a paralytic weakness. The entire body soon becomes involved, and the apparent paralysis may disappear or simply share in the general muscular debility. These cases are described as *paralytic chorea*, monoparesis being the most common type. Church* is of the opinion that many of these cases really belong to the neuritides or to a myelitis, or are combinations of these with chorea.

The movements observed in the face are a twitching of the eyelids and distortion of the mouth. The tongue exhibits marked choreic twitchings in the majority of cases, even in such where movements of the extremities are slight. Sachs† places especial diagnostic value on the movements of the tongue and associated facial action in propulsion of the same, describing these combined movements as the "facies" of chorea. The tongue movements are slow and coarse, and propulsion of the tongue is attended with unnecessarily wide opening of the mouth, raising of the eyelids and eyebrows with the same effort, and catching of the tongue between the teeth through choreic movement of the masseters.

The head may be turned from side to side and the shoulders alternately raised and lowered. The hands are alternately flexed and expanded at the wrist, and the arms are thrown about in an irregular and jerky manner in severe cases. Attempts to control these irregular movements or to perform voluntary acts only intensify them, and the child may become unable to feed itself or execute

* Church and Peterson, "Nervous and Mental Diseases."

† "Nervous Diseases of Children."

other co-ordinate acts. When the child's hand is taken between the hands of the examiner, the irregular muscular contractions are readily felt. By directing the child to perform some voluntary act, they are demonstrated to the eye. The legs may be so affected by the muscular weakness and inco-ordination as to render it necessary to put the child to bed. Although sleep may be so disturbed as to exhaust the child to the extreme, and the great restlessness render it necessary to protect the child against falling out of bed, still in the majority of cases the movements abate on lying down and disappear entirely during sleep. The latter symptom is pathognomonic of chorea, serving to distinguish it from other motor disturbances.

The temperature is normal in most cases; an elevation of several degrees should lead to a suspicion of rheumatism or endocarditis. The heart shows evidence of sub-acute endocarditis not unfrequently in young subjects. In older children mitral regurgitation is closely associated with chorea. Beside these organic manifestations, a cardiac neurosis is also encountered, inducing a group of symptoms which disappear with the disease. Both arrhythmia and a systolic murmur may be present, simulating valvular disease; but the murmur varies from day to day in intensity, is not transmitted, and the pulmonary second sound is not accentuated. The condition has been called *cardiac chorea*, and is supposed to indicate irregular innervation of the papillary muscles.

The mental state of the child is one of irritability, mental lethargy with deficient memory and power of concentration, and it may even assume a maniacal type of disturbance. Although true mental derangement is rare, it is not unusual to observe a highly-exalted psychical state, especially with relapses or acute exacerbations in severe cases. The face becomes flushed; the eyes are brilliant, and have a wild, staring expression; there may be alternate crying and laughing or simply crying out, and the general condi-

tion becomes greatly aggravated. With proper management such outbreaks are only of short duration, but they may become of serious import when associated with fever and progressive exhaustion, even terminating in coma and death. This constitutes the *choreic status*, which, however, is fortunately seldom encountered in the common type of chorea.

The *course* of chorea is quite variable. Although usually described as a self-limiting disease, it is, nevertheless, one which can be controlled to a marked degree by medication, whereby its course may be materially shortened and the symptoms greatly moderated. On the other hand, although complete recovery is the rule, there are numerous instances in which as high as a dozen relapses have been noted, or in which the child carries the evidences of chorea to adult life. The average duration can be placed at about from two to three months, always remembering the possibility of relapses, especially in girls. In a series of dispensary cases reported by Bayley* the average duration from the time of onset was 19.4 weeks, and from the time of beginning treatment it was 12.1 weeks.

Diagnosis.—The main source of error in the diagnosis of chorea will arise from mistaking the motor disturbances of such conditions as *post-hemiplegic chorea* and *athetosis*, which are postplegic movements associated with paralysis of cerebral origin; and those of *Friedreich's ataxia*, *multiple cerebro-spinal sclerosis* and *hysteria*.

The history of the case, the facies of chorea, the characteristic movements and the association of rheumatic symptoms should, however, serve to distinguish it from any of the above-mentioned conditions.

Treatment.—As soon as evidences of chorea are observed the child should immediately be taken from school, and every effort made to eliminate every element from its sur-

* "Trans. Hom. Med. Soc. of Penn.," 1896.

roundings tending to excite it or aggravate a condition requiring the greatest patience and kindness in its management. Rest in bed is indicated in all grave cases or those of abrupt onset. Bartlett advises against all forms of physical exercise, but a sojourn in the country, with plenty of fresh air and out-of-door life, is of unquestionable benefit in all cases of moderate severity.

The diet is of importance. Remembering the rheumatic element in these cases, fats, especially cod-liver oil, are of decided value. The free use of meats should be interdicted, but milk, eggs and vegetables may be taken liberally.

Extreme restlessness, insomnia and mental excitement are frequently controlled by a warm sponge-bath, to which alcohol may be added. Hot milk is also a valuable adjuvant in these cases.

The remedies from which I have obtained the most positive results are *belladonna*, *causticum*, *stramonium* and *agaricin*. Bartlett recommends the last remedy in the second decimal trituration in all cases not presenting strong indications for any other remedy.

Where rheumatic symptoms are prominent, *actea rac.*, *rhus tox.* and *sulphur* are frequently indicated and of value.

In the choreic states I have found *bell.* and *stramonium* of the greatest service.

Arsenicum, the chief remedy of the old school, administered in the form of Fowler's solution, and *ferrum* are useful when anæmia and other conditions pointing to these remedies are prominent symptoms.

Agaricus.—Spasmodic, jerky movements of the extremities and frequent nictitation of the eyelids (*hyos.*). Sensation of coldness and tingling in various parts; paralytic weakness of legs; aggravation of symptoms during a thunderstorm.

Bell.—Great mental excitement; delirium approaching to a maniacal condition; the face is flushed and the eyes

are brilliant and staring; there is great difficulty of speech, and a sensation of dryness and choking in the throat.

Stramonium should be given if *bell.* does not promptly relieve these symptoms, and if there is an incessant throwing about of the arms and a highly frightened behavior of the child.

Caust.—Paralytic chorea with speech defect. The child stands in a limp, relaxed condition; it is hardly able to walk or dress or feed itself; the voice sounds thick and unintelligible, and the tongue is protruded with difficulty. In such cases *causticum* may be considered well-nigh a specific, and I have obtained the best results when following Jahr's advice and administering the remedy in single doses, only repeating as the progress of the case would indicate the necessity for another dose.

Cimicifuga.—Rheumatic pains in the small joints; endocarditis; after suppression of menses.

Cina.—Helminthiasis or intestinal indigestion.

Coccul.—Right-sided chorea; face puffed and bluish; hands and feet look as if frozen; paralytic symptoms.—(C. G. R.)

Hyos.—Constant twitching of the eyelids; angular gyratory movements, with inco-ordination; misses what he reaches for; silly expression of face, smiling at everything he hears; chorea after debilitating fevers.

Ignatia.—Highly nervous temperament; easily frightened; starts at the slightest noise; irritable temperament. Mild cases.

Mygale.—Constant turning of the head to the right side, occasionally dropping it on the shoulder.

Nux vom.—Sensation of numbness in the affected parts; frontal headache, constipation, indigestion, irritability and lassitude.

Pulsatilla.—Chlorotic subjects; mild, tearful disposition; functional cardiac disturbances.

Stramonium.—Chorea developing after fright. The symptoms are usually severe, and may approach the choreic

state. (See *Belladonna*.) The movements are marked, but there is not the degree of paresis calling for *causticum*.

Sulphur.—Protracted cases with frequent relapses; rheumatic family history: after suppression of eruptions. Other constitutional remedies which may be called for upon purely diathetic indications are *calc. carb.* and *phos.*, *mercurius*, *phosphorus* and *silicea*.

Hysteria.

The classification of hysteria with the foregoing conditions is based upon the absence of an organic lesion in the disease and the great preponderance of motor disturbances belonging to the same. A variety of paralyses, however, belong to the prominent symptoms of hysteria, and frequent reference to this disease will become necessary in the section on "Paralytic Affections;" but it was deemed better to describe all of the manifestations under a single heading rather than divide them into several sections to conform with clinical types.

Hysteria is a psychoneurosis combining cerebral insufficiency with certain disturbances of the sympathetic nervous system, "A state in which ideas control the body and produce morbid changes in its functions."—(MOEBIUS.) Almost any organic disease can be simulated by this peculiar nervous derangement, for which reason its recognition and proper understanding are of the highest importance. Children are by no means exempt from hysteria, and sex bears no etiological relationship to the disorder. Although it may be encountered in early childhood, it is rare before the tenth year, and most prevalent at the period of puberty and adolescence. Heredity plays an important rôle, a neuropathic family history being present in most cases. As exciting causes, emotional disturbances—especially fright, grief, jealousy, and minor traumatism in which the mental shock sustained at the time of the accident plays the most important rôle—are inseparably connected with hysteria.

In the latter instance suggestion also enters into consideration, being one of the strongest influences in exciting as well as in removing hysterical phenomena. Reflex irritations, such as tight and adherent foreskin or adherent hood of the clitoris, have been mentioned as exciting causes. To these must also be added the baneful influence of improper training and discipline, bad habits, and various debilitating illnesses.

Symptomatology.—In reciting the symptomatology of hysteria, the general attributes and characteristics of the disease will be outlined, after which the special symptoms and clinical types will be considered. The first are spoken of as the *stigmata*, while the latter are designated the *accidents* of hysteria.

STIGMATA.—The *mental condition* is characterized by diminished will power, loss of memory and lack of determination, and indecision. Impressionability and irritability characterize the temperament. They are very susceptible to suggestions, and the mood vacillates between sadness and gayety, uncontrollable paroxysms of alternate laughing and crying being a frequent occurrence in these subjects.

Disturbances of sensibility are encountered as complete or partial cutaneous anæsthesia, or hyperæsthesia in certain localities. It is usually found in parts which are paralyzed, a hemiplegia with anæsthesia being strongly indicative of hysteria. Irregular islets of anæsthesia are likewise characteristic of hysteria. The mucous membranes may be anæsthetic and the special senses become perverted or abolished, leading to disturbance of sight, hearing, etc., or sudden blindness or deafness. The reflexes are not affected, as they are in organic lesions associated with anæsthesia.

The *motor disturbances* to be observed are a general retardation of voluntary movements and muscular weakness and inco-ordination. This is explained by the presence of anæsthesia and loss of muscular sense and of the power of mental concentration.

The *diathesis of contracture* (CHARCOT) is a tendency to rigidities and contractures, which can be demonstrated by inducing a forcible flexion or extension in a limb, or by irritating the muscles by deep massage or by means of the faradic current.

To the *accidents* of hysteria belong certain transitory disturbances manifesting themselves as convulsive seizures (*grand attacks* ; *hystero-epilepsy*), or as motor and sensory disturbances of major degree, closely simulating a variety of diseases.

Grand attacks belong to the rarer forms of hysteria in childhood; but as they bear a superficial resemblance to epilepsy, they will be considered in full. The attack is preceded by depression of spirits and a sensory aura, most commonly the *globus hystericus*. A general tonic spasm, which persists for a few minutes, marks the first stage of the attack. The child lies stretched out, with the limbs extended and rigid, the fingers and toes being flexed. Slow, rigid movements of wider range executed by the arms, and flexion and extension of the feet, may be observed during this stage. The jaws are tightly closed, and respiration is slow and irregular or entirely suspended. The face assumes a bloated appearance, and the veins of the neck are prominent and swollen.

The clonic stage is ushered in by short, jerky movements involving the face and extremities. These movements increase in severity, but do not assume the regular clonic type of epilepsy, being more irregular and of a straggling character. Respiration becomes interrupted and sobbing. Biting of the tongue is rare, also involuntary defecation and micturition. After the course of a few minutes the movements cease abruptly, and a period of resolution or repose sets in—a condition simulating sleep. This may end the attack, or be succeeded by the period of *clownism*, during which the patient becomes fixed in a variety of rigid postures. Extreme opisthotonos is a common posi-

tion observed in hysteria. A phase of large movements now follows, in which the subject may cry out in fear or rage and strike or bite at those about him. Peculiar sounds are sometimes uttered resembling, for instance, the barking of a dog, and, when associated with the above symptoms, constitutes spurious hydrophobia.

The period of passional attitudes observed in adults is very rarely seen in children. The period of *delirium*, in which the child sobs and pleads in a pitiful manner, or expresses various hallucinations, terminates the attack, after which it arouses to a state of complete consciousness.

Motor accidents occur as paralyses and contractures. There may be monoplegia, hemiplegia or paraplegia, which may be followed by contractures, or the palsies may alternate with contracture. The paralyzed part is frequently anæsthetic, and the anæsthesia corresponds to the cortical distribution of sensation, not being distributed to one or more nerve trunks, as in peripheral nerve and spinal affections.

In hemiplegia the face escapes, with the exception of the eye-muscles, which are at times affected. Anæsthesia is common, while in organic cerebral hemiplegia it is rare. Again, the contractures of hysteria partake more of the nature of spasmodic voluntary resistance, and atrophy never takes place excepting as a slight amount of wasting resulting from non-use. Loss of power is not absolute, and the degree of paralysis may vary from day to day. The gait also differs from that observed in cerebral palsies in that the leg is dragged along in a limp condition, not being swung out in a lateral direction, by which the foot is made to swing in an arc.

Paraplegia may exist as a purely ideational palsy, rendering walking impossible, or there may coexist disordered function of the cord, indicated by increased knee-jerk, spurious ankle-clonus, retention of urine and spinal tenderness. When contractures are present, the legs are extended in all of the joints.

Astasia abasia is a condition of lost co-ordination for walking and standing. It is produced by alternate contractions of antagonistic groups of muscles.

Hysterical coxalgia is a most important subject presenting itself for consideration to the pædiatrist. No doubt, the numerous cases of so-called reflex paralysis and coxalgia reported as having been cured by circumcision belong to this category. Apparently, every subjective and objective symptom of hip-joint disease has been mimicked by this neurosis, and nothing short of a careful examination under an anæsthetic will serve to differentiate them in well-developed cases.

Tremors and *rhythmical spasms*, the latter simulating chorea, are other motor accidents deserving mention.

Sensory Accidents.—A *pseudo-meningitis* is occasionally encountered, and is distinguished from true meningitis by the history, a regular pulse and active pupils. In other respects it bears a close similarity to meningitis, presenting intense headache; vomiting; fever; vasomotor streaks (*taches cérébrales*), and rigidity of the neck and extremities.

Spinal tenderness may be confined to the region of a few vertebræ and closely simulate Pott's disease; but if the patient's attention can be momentarily distracted, quite a considerable amount of pressure will be borne without causing pain.

Visceral Accidents.—Disturbances in the respiratory tract show themselves as *aphonia*, usually developing suddenly after a fright, the voice being lost, but cough persisting; *dyspnœa*, due to laryngeal or diaphragmatic spasm; *tachypnœa*, sudden attacks of extremely rapid breathing, presenting alarming symptoms, without the evidence of physical signs to account for the same, and *pulmonary congestion*. The latter is rare. It may produce cough with bloody expectoration, and simulate phthisis.

In the digestive tract, *vomiting*, *globus hystericus*, *œsopha-*

geal spasm, *anorexia* and *obstinate* constipation are to be observed. .

Frequent urination of large quantities of pale, limpid urine or complete anuria, sometimes retention of urine, are the disturbances encountered in the urinary tract.

Vasomotor and Trophic Accidents.—*Cutaneous hæmorrhages* and *gangrene* of the skin are among the rare hysteroneuroses, while *erythema* and *vesicular eruptions* are commonly met with. *Dermatographism* is occasionally observed.

Muscular atrophy and *fibro-tendinous contractures* are rarely well marked, although they may be developed to a sufficient degree to require tenotomy in cases of long standing.

The muscles do not give the reaction of degeneration, although they may be partially atrophied and show a quantitative loss in electrical excitability.

The *prognosis* of hysteria is especially favorable in children, as they are readily influenced by suggestion; and if the proper surroundings and intelligent treatment can be provided, recovery is generally comparatively rapid. The accidental disturbances, as a rule, disappear spontaneously after a variable period of months or years, or they may be purely transient. The mental state can, however, seldom be improved beyond a certain limit, and the hysterical temperament will persist throughout life in the majority of cases, even reflecting itself upon the offspring.

Sensory accidents are stubborn in their course, bringing considerable suffering to the patient and much anxiety to the friends and attendants.

In the *diagnosis* much importance is to be attached to a recognition of the stigmata of hysteria; in other words, the hysterical temperament, in conjunction with the emotional origin of the ailment and the polymorphous and changeable character of the manifestations. Beside this, the differential features serving to separate hysterical from

organic diseases, as pointed out in the symptomatology, should serve in leading to their recognition. This applies particularly to paralytic affections, which are of especial interest to the pædiatrists.

In coxalgia an anæsthetic may be required to remove any doubt in establishing the condition under consideration.

Hystero-epilepsy is rare in children, and its differentiation from epilepsy has been discussed in the article upon that subject.

Treatment.—The general management of hysteria resolves itself into removing all exciting causes, isolation being the most effectual method for this purpose; attending to the removing of all sources of reflex irritations, such as phimosis and errors of refraction, and building up the constitution by means of regular calisthenic exercises, a highly-nutritious diet and a liberal amount of sleep.

Suggestion presents itself as a most potent agent in restoring the patient's confidence and overcoming the various disturbances which have an imaginary origin. In managing cases of paralysis our main effort must be in the direction of promising the patient that the line of treatment employed will bring speedy results. To emphasize this suggestion such adjuvants as massage and electricity are employed with benefit in conjunction with a remedy. This does not, however, apply to ill-managed cases of long standing, in which the surgeon's aid must be sought.

The beneficial results following upon even the most trivial surgical measures resorted to in hysterical cases is a noteworthy clinical fact which often can be taken advantage of as a justifiable means of treatment of these cases.

Symptomatic prescribing serves a twofold purpose by augmenting the force of the suggestions and also by improving the patient's general condition and correcting the various disturbances in the nervous system and other regions. It is needless to mention the close relationship

existing between neurasthenia and hysteria in children, and therefore remedies which will improve the nutrition of the nervous system cannot fail to influence the hysteria directly. Such remedies as *picric acid*, *calcareo carb.*, *silicea*, *phosphorus* and *natrum mur.* exert a potent influence in this direction.

Remedies possessing notably hysterical symptoms are *ignatia*, *hyoscyamus*, *aconite*, *asafœtida*, *moschus* and *tarantula*. They promptly relieve many of the emotional and visceral disturbances, and also exert an inhibitory influence upon the hysterical temperament. The efficacy of drugs in such conditions as hysterical palsy and hystero-epilepsy is doubted by some. Arndt* expresses the opinion that "they are often helpful, especially in times of great emotional excitement." If that is the case, a remedy should also be useful at any other time when its symptoms are present, even if the disease is hysteria.

An unfortunate mistake too frequently made is to treat these cases entirely as imaginary troubles, forgetting that, although they are of mental origin, they are, nevertheless, just as real to the patient as any other disease.

Paralytic Affections : Cerebral Palsies.

The cerebral palsies of childhood comprise a group of conditions which may be either of intra-uterine onset, or which are acquired during parturition or at a still later period. Cases of intra-uterine origin are usually developmental in character, and to this group belong parencephalia, agenesis corticalis, and other defects, although evidences of hæmorrhage and sclerotic changes, as a result of traumatism and syphilis, have been observed in rare instances.

In birth-palsies, hæmorrhage is due to primary lesion. It occurs frequently in protracted labors, and although forceps-pressure may directly induce a hæmorrhage, it does

* "Practice of Medicine."

not play as prominent a rôle as long-continued compression of the head in the pelvic straits or within the uterus. The bleeding takes place from the capillaries and veinules of the pia mater or choroid plexus in most cases, rarely from the longitudinal veins, and almost never from an artery. Venous congestion attending compression of the cord and asphyxia may give rise to a final hæmorrhage, but the weight of evidence is in favor of attributing the majority of cases of asphyxia neonatorum to a hæmorrhage. Where the amount of blood-extravasation is not sufficient to cause death, it ultimately absorbs or becomes organized, with consequent sclerosis of adjacent areas of brain-substance and developmental retardation. The symptoms attending such a condition will naturally depend upon the locality affected.

The cerebral palsies encountered later in child-life are the result of either hæmorrhage, embolism or thrombosis. A cerebral abscess or tumor may likewise cause definite paralytic manifestations, but in their etiology and clinical course they differ distinctly from the foregoing conditions. Hæmorrhage at this period of life is more frequently meningeal than cerebral. It may result from traumatism, arteritis, or from a sudden and severe venous congestion of the brain occurring during a convulsion or during a paroxysm of whooping-cough. The last-mentioned condition is by no means a rare cause for apoplexy, being the most frequent in the cases coming under my notice. In reference to convulsions, it is often difficult to determine whether the convulsion was the cause or the result of the hæmorrhage, as a hæmorrhage is almost invariably accompanied by convulsions.

Abscess is most frequently secondary to suppurating otitis media.

Sinus thrombosis results from extreme anæmia in conjunction with feeble heart's action occurring during exhausting illness, or an infection from the middle ear may pro-

duce thrombosis of one of the lateral sinuses. Embolism is most frequently associated with endocarditis, only in rare instances originating from clots which have formed in the left auricle or elsewhere.

Symptomatology.—The lesions just enumerated may be productive of a variety of manifestations, for which reason we may encounter either hemiplegia, diplegia, paraplegia or monoplegia in these cases. The last two are rare, especially monoplegia, and paraplegia is frequently only apparent—a careful examination revealing evidences of paralysis in the arms, together with mental deficiency.

Hemiplegia most frequently develops from one of the causes enumerated as productive of the palsies acquired after birth, and resembles the apoplexies of adults in many respects. Its onset is attended by convulsions, affecting the paralyzed side or becoming general. Coma may persist for some hours, after which the child is found completely paralyzed on one side. Aphasia is present as a rule, but the faculty of speech is much more rapidly and fully regained than in adults. Following the paralysis there occurs spastic rigidity, which, in turn, results in the development of contractures in the affected extremities. Owing to the disability thus sustained, a checking in the process of growth takes place, resulting in deformity of the chest, spine and pelvis.

In the course of a year or more peculiar automatic movements, known as athetosis, take place in the fingers of the paralyzed hand. They consist of continuous, purposeless, vermicular movements, intensified by voluntary efforts, or only occurring with such efforts or from emotional excitement. They are not as constantly seen in hemiplegia, nor are they of the wide distribution observed in diplegia. Associated movements are usually observed in the affected members.

The arm recovers its power to a less degree than the leg, while in diplegia the legs are more affected than the arms.

The mental condition is impaired, and the head is usually small or of irregular form. Epilepsy develops in about one-half of these cases, assuming the true degenerate type of the disease.

Diplegic cases are congenital, or result from injuries sustained during parturition. As above stated, the lower extremities are most markedly affected, and athetosis is a prominent symptom. These children are observed to be mentally deficient from the earliest period of childhood, and rigidity of the muscles is present to a marked degree, giving the limbs a peculiar stiffness which reminds one of the resistance encountered in bending a piece of lead, for which reason it has been described as "lead-pipe rigidity." Together with this there is a spastic condition of the lower extremities and a tendency to equino-varus. The gait is, therefore, extremely difficult or impossible, and the hands are usually not well under control, being entirely helpless if athetosis is marked. A type of congenital diplegia resulting from defective development of the pyramidal tracts in the brain and cord, seen in underdeveloped children, has been described by Little, of London. They are not deficient in mind, and the spastic condition usually improves with the development of the nervous system.

Sachs* has reported a series of cases of congenital cerebral agenesis occurring as a family disease, in which amaurosis, progressive debility and a fatal termination are the clinical features. More or less diplegia, with spasticity, is usually present in these cases.

The *prognosis* is unfavorable in all cases, but especially in the diplegic forms, in which little can be done outside of improving the child's general condition by means of massage and faradism, or by surgical measures when indicated. The proper training of such cases is, however, of the greatest importance, through which means both the mind and body can be most wonderfully improved.

* "New York Med. Jour.," May, 1896.

In recent cases of hemiplegia the child must be dealt with purely symptomatically, and remedies are of decided use here. Massage and faradization of the extensor muscles, and mechanical appliances to overcome contractures, are generally useful. *Arnica*, *kali hydrojod.* and *sulphur* are aids in absorbing the hemorrhagic extravasations, while *causticum*, *cocculus* and *cuprum* frequently exert a beneficial influence upon the paralytic symptoms.

Poliomyelitis.

The term poliomyelitis indicates a condition in which the gray matter of the spinal cord is affected, the inflammation attacking mainly the anterior horns. The *acute form* is practically a disease of childhood, being most frequently encountered in the later period of infancy. It is occasionally encountered in adults, and then usually assumes a *subacute* type.

Regarding the *etiology* nothing definite is known, but, on the strength of the clinical course of the disease—marked by rapid onset, with fever and other constitutional disturbances, its great predilection for the age of childhood, and the frequency of endemic and epidemic outbreaks—we are justified, in the present state of our knowledge, in classing it among the infectious diseases.

Symptomatology.—The onset is rapid, with fever of a moderate degree and some constitutional disturbances, even delirium and convulsions having been observed, or they are so slight as to escape notice, and the child develops an extensive paralysis, without any apparent cause for the same being associated. The stage of invasion, therefore, varies from a few hours to several days, and is of little diagnostic value.

The paralysis is usually of extensive distribution in the beginning; but as improvement sets in the paralysis becomes limited to those regions which have been most seriously affected, in which muscular atrophy also develops.

With the onset of paralysis local tenderness in the limbs may be noted. The paralysis rapidly increases, remains stationary for a period of a week or two, after which it rapidly improves in certain regions, while in others prominent disability remains and wasting of the muscles sets in.

The reflexes are lessened or abolished, according to the extent of the paralysis, but control over the sphincters is rarely lost, such an occurrence indicating a grave outlook. The alteration in the electrical reaction of the muscles manifests itself as the reaction of degeneration. The growth of bones may be greatly retarded through involvement of their trophic centres in the cord.

The distribution of the permanent paralysis varies greatly in individual cases. It may involve one or more extremities or remain confined to a few muscles of an extremity. The lower extremities are most frequently affected, but seldom equally. In the leg the most common deformity encountered is *talipes equinus* with flexed leg, resulting from wasting of the extensor muscles. In the upper extremities the deltoid, the extensors of the wrists and the interossei are most frequently affected.

The *prognosis* is usually unfavorable regarding recovery of function in the paralyzed and atrophied parts, although there is seldom danger to life. Reaction to faradic stimulation is always a favorable sign, even when the muscles have failed to respond to this test earlier in the disease. Early loss of the same, however, indicates a permanent paralysis in most instances.

Diagnosis.—The diagnosis of both the early as well as the late manifestations of poliomyelitis anterior may be beset with difficulty. Until paralysis is well developed, the disease cannot be positively recognized, and then it may be confounded with *rachitic pseudo-paralysis*, *multiple neuritis* and *cerebral palsy*. The latter is of abrupt onset, is ushered in by convulsion, and the paralysis is one-sided and uniform. The pronounced muscular atrophy of poliomyelitis

and the reaction of degeneration, together with the history, should serve to differentiate it from all of the above conditions.

The Idiopathic Muscular Dystrophias bear a close outward resemblance to the later manifestations of poliomyelitis anterior. They have been divided into a variety of clinical types, but are all closely related both etiologically and pathologically. The main point of distinction between these myopathies and poliomyelitis is their slow and progressive development, the symmetrical distribution of the atrophic changes, and the strong hereditary element and developmental factor in their etiology.

The following types have been described:

The Juvenile Type of Erb.—In this form the muscles of the arms and shoulders are mainly affected.

The Facio-scapulo-humeral Type of Landouzy-Déjérine, in which the face, together with the arms and shoulders, are affected.

The Peroneal Type of Charcot and Marie, in which the peroneal muscles become atrophied. This may be followed by atrophic changes invading the legs, trunk and upper extremities, and there is evidence of cord-lesions associated with the atrophy, showing itself as fibrillary twitching and reaction of degeneration.

Pseudo-hypertrophic Paralysis is a disease of early childhood, most frequently seen in boys, characterized by enlargement of the calves and buttocks, associated with atrophic changes. The muscles finally shrink, presenting the same condition as the other forms of atrophy. The characteristic symptoms produced are a waddling gait; difficulty of climbing up stairs and great awkwardness; enlargement of the legs and buttocks; lordosis; inability to arise from the ground without the aid of the hands. In order to attain the erect position the child supports the hands on the anterior surface of the thighs and gradually pushes himself upright.

Treatment.—The child should be disturbed as little as possible, not interfering with ill-judged applications of faradism to the affected limbs during the acute stage, but wrapping them in cotton and enjoining absolute rest.—(BARTLETT.)

Later in the disease electricity proves of decided benefit. If the muscles do not respond to the faradic current the galvanic should be employed. The object is to produce muscular contractions in order to improve the nutrition of the muscle and restore function as far as possible. Passive movements and massage should be added to the treatment in order to overcome deformities. When once established, they will require surgical measures to correct them.

The remedies indicated in the early stages are such as will control the inflammatory condition, with the hope of lessening the secondary destructive changes. *Acon.*, *bell.*, *bry.*, *gels.* and *rhus tox.* should be studied and carefully differentiated if there is a sufficiency of symptoms to prescribe upon. Otherwise, *bell.* should be given the preference. *Mercurius* may be given with a view of absorbing exudation as promptly as possible. *Plumbum* is indicated at a later period. “The symptoms of chronic lead-poisoning correspond very closely with the symptoms of poliomyelitis.”—(C. G. R.)

Family Ataxia.

Family ataxia, also known as *Friedreich's disease*, occurs as a family disease, several or all of the children of a family being attacked by a degenerative process of the posterior and lateral columns of the spinal cord as a result of teratological defects in its structure. The first symptoms usually make their appearance shortly before puberty, a period at which the processes of growth and nutrition are taxed to their utmost. The succeeding cases usually develop at a progressively increasing earlier period of life. An acute infectious fever may also hasten the development of symptoms, leading to its occurrence in early childhood.

Hereditary cerebellar ataxia of Marie is characterized by a similar defective condition in the cerebellum; but it develops after pubescence, and is accompanied by pronounced choreic movements, increased deep reflexes, and optic-nerve atrophy, symptoms not belonging to spinal ataxia.

Symptomatology.—One of the earliest symptoms noticed is an awkwardness in the legs, marking the beginning of the ataxia. Later the arms become involved. There is first unsteadiness in walking and standing, the child sways from side to side in attempting to maintain its equilibrium. As the muscular sense is not lost, the condition depending entirely upon inco-ordination, no increased difficulty in standing is noticed when the eyes are closed. The ataxia is associated with gradually increasing loss of power. The knee-jerk is lost early in the disease, distinguishing it from the cerebellar variety, in which there is also an ankle clonus at times.

Disturbances of speech develop as inco-ordination becomes general. The speech is irregular and jerky, and lacks modulation and rhythm.

Nystagmus may develop later in the disease, being especially noticed with lateral rotation of the eyes. The expression is one of apathy and indifference, although the intelligence is not impaired early, but it becomes more or less retarded with the progress of the case, as also the physical development. Shortening of the foot, with exaggerated plantar arch and retraction of the great toe (*club-foot* and *hammer-toe*), is a common deformity of family ataxia, as also dorso-lumbar scoliosis. These deformities may develop before ataxia becomes pronounced, and constitute an early sign of the disease.

The *course* is that of a progressively-increasing and hopeless malady, but remissions or aggravations may take place. There is nothing in the disease itself to cause death, for which reason a case may attain the age of thirty or more unless an intercurrent ailment carries him off.

Isolated cases are to be differentiated from *cerebellar ataxia*, *chorea* and *insular sclerosis*. In the latter there is characteristically scanning speech, spastic gait and infarction tremor as distinguishing features.

Hereditary Spastic Paraplegia.

This is a rare disease, first described by Strümpell, marked by spasticity and hypertonus of the muscles of the lower extremities, without sensory disturbances or involvement of the sphincters, or other symptoms of note. The reflexes are increased. Bayley* reported a series of cases in which the disease was traced through five generations. The pathological findings are those of a degenerative process in the pyramidal tracts, the direct cerebellar tract and the columns of Goll. Like family ataxia, it is undoubtedly due to an embryonic defective development in these parts.

The course is slow and progressive.

Syringomyelia.

Syringomyelia is a disease of the spinal cord in which the cerebral canal becomes pathologically enlarged through the result of gliomatous infiltration, which subsequently breaks down. By the same process new canals of considerable length may be formed within the gray matter of the cord. Although a rare disease in childhood, it has occasionally been encountered at an early period of life, presenting a variety of symptoms requiring a careful differentiation from other nervous affections. As to its etiology, nothing definite is known.

The symptoms resulting from a cerebral myelitis or from a hæmorrhage into the cord—the latter, at times, occurring during parturition—cannot be distinguished from those belonging to the gliomatous variety.

Symptomatology.—The disturbances of syringomyelia may be divided into several groups. Involvement of the

* "Jour. Nerv. and Ment. Diseases," November, 1897.

sensory pathway in the gray commissure and posterior horns and columns gives rise to loss of pain and heat perception, without, however, loss of the tactile sense. This anæsthesia may be so complete and extensive as to render the patient insensible to almost any kind of pain and expose him to many dangers.

Motor disturbances develop later than the sensory, and present paralysis of groups of muscles of a limb, usually becoming bilateral and accompanied by trophic changes. The reaction of degeneration is present. These symptoms indicate involvement of the anterior horns and pyramidal tracts.

Vasomotor disturbances producing cyanosis, coldness, cutaneous eruptions and dermatographia may accompany the above process. Trophic changes, with resulting atrophy, fragility of bones, enlargement of the hands, and tendency to the development of whitlow and abscesses, are also present.

The *course* is progressive, and results fatally when bulbar crises set in. In the diagnosis the *idiopathic muscular dystrophias*, *hysteria* and *multiple neuritis* are to be excluded. The distinct features of syringomyelia are its gradual development and insidious onset, and the dissociation of touch and pain in conjunction with motor, trophic and vasomotor disturbances.

Multiple Cerebro-Spinal Sclerosis.

Multiple or *disseminated* sclerosis, as the name implies, is a degenerative process affecting the brain and cord as an irregularly scattered sclerotic process. The islets of sclerosis are found principally in the centrum ovale, crus, pons and medulla in the brain, and in the cord they are irregularly scattered, as a rule attacking the white matter more prominently than the gray. It is most common between the ages of twenty and thirty, but is not infrequent in children, and may be congenital.

The *cause* of multiple sclerosis is probably to be found in an infection, but, judging from the numerous and often mixed infections noted, it seems unlikely that we have to deal with a specific organism.—(CHURCH.)

Symptomatology.—Owing to the widely-distributed lesions of multiple sclerosis a variety of disturbances are encountered in the nervous system. The characteristic and most prominent features of the disease are:

(a.) *Motor.*—A coarse, jerky inco-ordination, especially in the arms, observed on attempts at voluntary movements. This intuition tremor is associated with progressively increasing loss of power. The gait is spastic; is associated with deranged equilibrium (cerebello-spasmodic gait).

(b.) *Sensory* disturbances are practically confined to the eye. Nystagmus is a frequent symptom, and optic neuritis and atrophy may develop.

(c.) *Cerebral Disturbances.*—The speech defect, known as “scanning speech,” in which there is an undue separation and accentuation of the syllables of words, and a state of indifference, loss of memory and dejection, are the prominent cerebral features of the disease. A predisposition to hysteria seems to exist, and it is not uncommon to find hysterical manifestations complicating multiple sclerosis.

(d.) The deep *reflexes* are exaggerated, as a rule, but there may be loss of knee-jerk, and paralysis of cranial nerves in some cases.

The *course* of multiple sclerosis is quite irregular. It may begin gradually and increase in a regular progressive manner, or it may begin abruptly as an apoplectiform attack, or with vertigo or visual disturbances. Remissions are not infrequent, and may lead to a belief that the disease has been checked; but complete recovery must be very rare, although Church considers it possible.

Diagnosis.—Multiple sclerosis is to be differentiated from *infantile cerebral palsy*, *hysteria* and *family ataxia*. In *infantile cerebral palsy* the history of traumatism during

birth and the early appearance of diplegia, followed by mental retardation, rigidity and athetosis, will serve as a distinguishing feature. In *hysteria* the mental stigmata, the absence of nystagmus, and the presence of sensory disturbances and muscular rigidity, are of great significance, although both diseases may be associated in the same patient. In *family ataxia* there is inco-ordination and not spasmodic muscular action; the knee-jerks are abolished, the muscles are flaccid, and the eyes are seldom affected, excepting by a slight degree of nystagmus, with lateral rotation of the eyes.

The *treatment* of these cases is very unsatisfactory. If the source of infection can be ascertained, we should resort to antidotal treatment in this direction. According to Arndt, *arsenicum* is of especial value. *Tarantula* has also been recommended. Bartlett refers to the salts of *gold*, *lead* and *mercury*.

Multiple Neuritis.

Inflammation of several nerves occurring at the same time or in quick succession occurs mainly from diphtheria during childhood. Malaria, typhoid fever, scarlet fever, measles, influenza and acute rheumatism are responsible for some cases, but to a much less degree than the first mentioned infection. Toxic cases are quite rare, as can be naturally inferred from the absence of the surroundings, occupations and habits, which are frequently the cause of multiple neuritis in adults.

The lesions are a degenerative process in the axis cylinders, not, however, affecting the nerve trunk uniformly and completely; associated with hyperæmia of the peri- and endoneurium; also degenerative processes in the spinal cord, and at times a similar process in the brain and cerebellum, especially in diphtheritic neuritis.

Symptomatology.—The clinical course of diphtheritic paralysis has been described under *Diphtheria*. In non-diphtheritic cases there is first noticed a general weakness

of the muscles, together with pain and tenderness along the affected nerves. Tingling and formication are also frequently complained of. The paralysis which results is usually of wider distribution, producing foot-drop and wrist-drop, inability to walk, and spinal curvature. Partial anæsthesia likewise develops, and considerable atrophy of the paralyzed muscles takes place. The knee-jerk is abolished, and if power of locomotion is not entirely lost the child shows marked ataxia in walking and standing. In the course of a few weeks improvement sets in, and complete recovery is the rule, although permanent loss of function may persist. This, however, is rare in children; and if the cause can be removed the prognosis is good. A fatal termination may take place in diphtheritic paralysis, or in other cases of rapid onset and wide distribution, in which the respiratory and cardiac innervation become involved.

Diagnosis.—The gradual onset, usually developing during the period of convalescence from an infectious disease or after exposure to damp and cold (rheumatic cases); the symmetrical distribution, and the accompanying sensory disturbances, will serve to differentiate multiple neuritis from *poliomyelitis anterior*, as well as from the various *ataxias*. Its tendency to progressive improvement and recovery is another feature of diagnostic importance.

Treatment.—The child should be kept in bed and put on a plain, highly nutritious diet. Mild galvanization of the affected nerves and, as atrophy sets in, massage of the muscles are of great benefit. To overcome deformity in the extremities it may be necessary to resort to mechanical devices.

Aconite.—Recent cases following exposure. Tingling and formication in the affected parts is its chief indication.

Arsen.—Malarial or cachectic cases; burning pains; general prostration.

Argentum nitr.—Ataxic symptoms.

Causticum is a most useful remedy for localized paralyses due to neuritis, or for the later changes of multiple neuritis.

Gelsemium is more useful in the early period of infectious cases.

Rhus tox. is of great value in rheumatic cases. Traumatic cases call for *arnica* and *hypericum*, especially the latter.

Symptomatic Affections: Neuralgia.

Neuralgic pains may be observed in malnutrition and anæmia, particularly in chlorosis, or they may indicate a malarial infection. Hysteria is another prominent factor in the etiology of various painful affections of childhood in which structural changes cannot be demonstrated, but on the whole neuralgia is uncommon before the period of puberty.

Gastralgia is a form of neuralgia which is usually the result of indigestion. It is discussed under the diseases of the stomach. Local irritations, especially carious teeth, are common causes for neuralgia.

Before a *diagnosis* of neuralgia can be positively made, it is essential to exclude all inflammatory conditions or local irritations which might possibly cause the pains complained of. This is especially necessary in children, as serious organic disease may be overlooked by neglect of this precaution.

The *treatment* is mainly constitutional. A sufficiency of out-of-door exercise should be combined with a diet consisting especially of fats, milk, and vegetables. If anæmia is a pronounced feature, this should be corrected, as recommended in the article upon *Anæmia*. Careful symptomatic prescribing affords prompt and usually lasting palliation; if relapses occur, a prescription based principally upon the diathetic condition will overcome this tendency, while during the paroxysm such remedies as *acon.*, *bell.*, *cham.*, *colocynth.*, *ferrum phos.*, *gelsem.*, *mag. phos.*, *rhus tox.* and *spigelia* should be administered at frequent intervals until relief is obtained.

Headache.

A variety of conditions—notably anæmia, lithæmia, eye-strain, neurasthenia, hysteria and gastric derangements—give rise to headache as a symptom meriting special attention. In inflammatory and organic brain affections it is a prominent symptom, and in the infectious fevers and in uræmia it is quite constantly present.

Migraine is an essential headache, coming paroxysmally and resulting from nervous discharges in the cortical sensory centres. The *exciting causes* may be any of the disturbances capable of producing headache, such as mental or physical fatigue, eye-strain, acute indigestion, etc. The condition itself is usually hereditary, and is one of the manifestations of a neuropathic constitution, being, so to speak, a sensory epilepsy.

The *symptoms* of migraine in childhood are the same as observed in adults, with the exception that they are not quite so severe and usually of less frequent occurrence. Scintillating scotomata are often observed, being described as fiery flashes or figures before the eyes. The pain may be confined to one side of the head, and is accompanied by nausea and vomiting, the latter relieving, as a rule, although indigestion has nothing to do with these attacks excepting that it may act as an exciting cause. Other disturbances—*e. g.*, amblyopia; hemianopsia; aphasia; numbness and tingling in various parts of the body, followed by anæsthesia, and possibly paralysis—may be observed during an attack.

The *diagnosis* of migraine is based upon the paroxysmal nature of the attacks, the presence of nausea and vomiting without gastric derangement, and the accompanying sensory disturbances. *Symptomatic headaches* are recognized by their transitory nature and the presence of one of the causes enumerated above as causing the same. It is important both from the standpoint of prognosis and treatment to exclude *intra-cranial disease* in these cases by carefully searching for evidences of the same, and observing the patient over a sufficient length of time to determine the true nature of the case.

Treatment.—Children subject to migraine should be carefully dieted, especially avoiding sugar and starch in order to overcome the formation of uric acid, which is generally excessive in these cases, and refractive errors should be immediately corrected. One of the following remedies will usually be indicated during the paroxysm.

Arg. nitr.—Deep-seated pains in the temples of a boring or pressing character, relieved by pressure. Dimness of vision with vertigo, tendency to fall to the side. At its height there is trembling of the whole body and internal nausea. Attack preceded by chilliness, indisposition and loss of appetite.

Bell.—Congestive headache; throbbing of the carotids; throbbing pains in the temples; face flushed. Often right-sided. The pain is worse lying down, and is temporarily relieved from sitting up.

Cham.—Beginning with flickering and fiery zigzags before the eyes. Great irritability of temper.

Glon.—Violent pulsations in brain from below upward; there is high arterial tension; vertigo; ringing in the ears and palpitation of the heart, each beat seeming to increase the pain in the head. Brought on by exposure to the sun.

Ignatia.—Hysterical headache; *clavus hystericus*; from emotional excitement or over-pressure at school. Highly nervous temperaments.

Iris.—The attack begins with blurring before the eyes and terminates with the vomiting of a yellowish, bitter, sour-smelling fluid. Usually right-sided.

Pulsatilla.—Left-sided attacks, with anorexia, belching and vomiting. Anæmic and mild, yielding subjects.

Sanguinaria.—Pain beginning in occiput and spreading over the top of the head, settling over the right eye. Great sensitiveness to light; flushes of heat and alternate chilliness. The attack ends in vomiting.

Spigelia.—Neuralgic pains over the left eye. Chlorosis.

Stannum.—Pains begin gradually, reach their highest point of intensity, and then gradually decrease in severity.

CHAPTER XVII.

DIATHETIC AND GENERAL DISEASES.

Lithæmia.

By the term "lithæmia" is understood a metabolic disturbance recognized as a group of symptoms resulting from the presence of incompletely oxidized products of tissue-waste in the blood. As uric acid is the most prominent and most demonstrable of these products, lithæmia is frequently spoken of as the *uric-acid diathesis*. Other products belonging to the same group, namely, that of the alloxuric bodies, are xanthin, hypoxanthin, heteroxanthin and paraxanthin; and, as the symptoms of lithæmia depend upon the presence of an excess of these bodies in the body media, the condition is in reality an auto-intoxication to which Rachford* applies the name *leucomania-poisoning*.

Croftan† sums up the subject of lithæmia in the following sentences, basing his assertions upon a careful perusal of the latest published investigations in this direction, notably those of Kossal, Horbaczewski, Gaucher and Fodor:

"1. Uric acid is a symptom only in the 'uric-acid diathesis,' and plays no etiological rôle whatever.

"2. The increase or decrease of uric-acid secretion gives no indication of the severity of the so-called 'uric-acid intoxication.'

"3. The symptoms of the 'uric-acid diathesis' are due to an auto-intoxication produced by the retention of substances called xanthin bases, and not of uric acid.

"4. The fundamental (heredity, idiosyncrasy, reduced vitality) etiological factor in the development of the complex

* "American Text-Book of Diseases of Children."

† "The Uratic Diathesis," Clinique, Jan. 15, 1897.

symptoms grouped under the name of 'uric-acid diathesis' is an increased katabolism of the cell nuclein, notably that of the leucocytes."

The formation of uric acid is, according to this theory, a conservative process, as uric acid is a non-toxic substance, while the xanthin bases possess marked toxic properties; and, by being oxidized into uric acid through a specific function of the kidney epithelia, the system is thus able to harmlessly eliminate them.

In the *etiology* of lithæmia heredity plays the most important rôle, as the other causes which produce it later in life, *viz.*, excessive proteid food, sedentary habits, alcoholism, etc., are not operative during childhood. Prolonged illnesses frequently establish the condition.

Symptoms.—Infants are frequently born with uric-acid infarcts in the tubules of the renal pyramids; these are washed out of the tubules and may be passed through the urethra or remain in the bladder, forming the nucleus for vesical calculi. Older children may also have symptoms of uric-acid excretion—lumbar pains, renal colic, painful urination, hæmaturia. Inspection of the urine will reveal the crystalline bodies. Another prominent symptom is enuresis.

The general symptoms of lithæmia are notably those referable to the gastro-intestinal tract, to the nervous system, and to the skin.

Nausea and vomiting accompanied by fever and coming in recurring attacks, acute and chronic intestinal catarrh, and stubborn dyspeptic symptoms, belong to the gastro-intestinal disturbances. Convulsions, migraine, asthma and cyclical vomiting constitute some of the most prominent nervous manifestations, while eczema is the well-known cutaneous manifestation of lithæmia.

Lithæmic children are as a rule delicate, dyspeptic, nervous, and excitable little individuals. They incline to be precocious, and possess strong tendencies to nervous and

catarrhal affections. Retarded nutrition is the keynote to an interpretation of this condition, which belongs to that group of morbid status known as arthritism (Bouchard), in which are included the principal constitutional diseases.

The *urine* excreted during a lithæmic paroxysm is usually scanty, highly acid and high-colored, depositing a large amount of uric acid and urates. The xanthin bodies have been demonstrated in enormous excess in the urine after certain severe paroxysms. Before an attack it is frequently passed in large quantities, being almost colorless and of low specific gravity, indicating irritation of the kidneys with insufficient elimination of solids.

Treatment.—The diet is of the highest importance in lithæmics. Sugar and farinaceous food must be cut down to the minimum; meat is allowable in moderation, and fresh vegetables, fruit, milk, fish, poultry, and stale or toasted bread may be partaken of liberally. They should also be encouraged in the free drinking of water, out-of-door exercise, and regular hours for sleep.

The remedies which have proven of the greatest usefulness in the lithæmic state in general are *berberis*, *china*, *lycopodium*, *natrum mur.*, *nux vomica*, *pulsatilla*, *sepia*, *sulphur*, *nitric* and *benzoic acid*. The symptoms upon which these remedies are to be prescribed are their well-known gastric, urinary and temperamental indications. (See Treatment of *Renal Calculi*, p. 222.) The remedies which may be called for in the special manifestations of this dyscrasia are numerous, and the reader is referred to the chapters covering these cases in their therapy.

Rickets.

Rickets is a chronic disease of childhood developing during the first dentition period. Although its actual cause is not positively known, improper feeding and unhygienic surroundings are inseparably connected with its development.

The greatest number of cases are seen in the closely-populated districts of large cities. It is especially prevalent among the foreign population and the negroes. Continued exposure to a vitiated atmosphere, laden with foul gases and deprived of sunshine, and improper and insufficient diet, composed of farinaceous food and deficient in fat, are the evils to which almost every case of rickets can be directly traced. Such a diet leads to intestinal fermentation, with the production of organic acids and other products interfering directly with the child's nutrition. Other factors which may act as predisposing causes are heredity (parental rickets and syphilis), maternal ill-health during pregnancy, and geographical location—rickets being practically a disease of the temperate zone and of cities.

The *pathological changes* of rickets are referable to the osseous system and to the blood. The osseous changes result from increased and irregular cartilaginous and sub-periosteal cell growth, with deficient deposit of earthy salts, and excessive destruction of bone already formed, through an abnormally active formation of medullary canals and canaliculi. This abnormal development of the osseous system can be directly traced to the impoverished condition of the blood supply and to the sluggish circulation. The latter induces a condition of chronic congestion of the bones and periosteum, approaching at times close to an inflammatory condition, for which reason the older pathologists considered rickets a chronic inflammation of the epiphyseal cartilages and periosteum. Macroscopically a rachitic bone presents certain well-defined characteristics. The epiphysis is swollen and knobby, due to greatly exaggerated proliferation of the cartilage cells in the chondroid layer. The epiphyseal cartilage is separated from the medullary cavity by this layer, which may reach a thickness of an inch or more. The shaft presents sub-periosteal thickening at its middle portion. The osseous tissue is loose and spongy, instead of being compact and resisting. The medullary

canal is abnormally large, although it may become constricted at certain portions by the encroachment of the proliferating mass.

Anæmia is a prominent symptom of rickets. There is a deficiency both in the number of red corpuscles and in the percentage of hæmoglobin, beside important developmental changes in the leucocytes. Cobb dwells with particular emphasis upon the importance of these conditions, which really explain the chief manifestations of rickets. Of the leucocytes, he remarks: "The white corpuscles are also at variance with the normal standard; they may be simply deficient in number or deficient in development; in pronounced cases they are abnormal in both of these respects. In the case of those presenting splenic enlargements, it becomes a more pronounced factor for evil. In such cases the number of erythrocytes and the percentage of hæmoglobin have been found less than one-half the normal proportion, while more than three-fourths of the leucocytes have not been developed up to a good working standard."*

Symptomatology.—The characteristic deformities of the osseous system are the late symptoms of rickets; and although they are pathognomonic, they should not be waited for before making a diagnosis of the condition. It is unfortunate if the disease is not recognized ere marked bone lesions have developed, as the best opportunities for treatment have then slipped by.

Rickets seldom develops before the sixth month, being practically a disease of the first dentition period. Its onset is usually associated with more or less persistent diarrhœa, a moderate range of fever, fretfulness, restlessness, with tendency to kick off the covers, and local sweats. The development of anæmia, debility, profuse sweating about the head and chest, and general sensitiveness of the body to touch, indicate that the disease has become fully established.

* "Rachitis," Clinique, May 15, 1897.

Constipation gives place to diarrhœa, and the abdomen becomes distended and prominent.

The entire muscular system is in an enfeebled, undeveloped condition. This accounts for the constipation, weak heart with sluggish circulation, and the rachitic pseudo-paralysis. The latter condition results directly from the ligamentous laxity, muscular feebleness and bodily tenderness; and although some pædiatrists incline to consider these cases a form of "pressure palsy," resulting from inflammatory changes in the vertebræ compressing the cord, such a condition, if indeed it ever exists at all, must be a very rare and exceptional one.

The first bony deformities to attract attention are the swelling of the wrists and ankles. As the disease progresses the condyles of the femurs and the ribs become involved. Rarely, however, are all of the characteristic lesions found in one case. The ribs become beaded in their anterior extremity, at the junction of the rib with the costal cartilage. This deformity is described as the *rachitic rosary*, and it can be demonstrated in almost every case on post-mortem dissection, although to find it pronounced enough to be plainly visible and palpable is not a common occurrence. Owing to the softness of the ribs, the thorax becomes compressed laterally, with resulting projection of the sternum; this is the *pectus corinatum*, or chicken-breast. Another deformity of the chest is a groove encircling the lower portion of the thorax, the result of eversion of the lower ribs from atmospheric pressure and abdominal distention. These deformities become especially prominent as a result of diseases of the respiratory tract.

Affections of the cranial bones are among the earliest signs of rickets. Softening of the occiput, with areas of craniotabes, can be demonstrated, especially in the region of the lambdoidal suture. The occipital region becomes flattened from the child lying upon its back. The sutures are late in closing, and the frontal and parietal centres

of ossification are prominently thickened. These developmental peculiarities give to the head a large, square appearance, very typical of rickets.

The softness of the bones of the palate and of the jaw predisposes to the development of deformities from the act of sucking and mastication.

The spinal column suffers more or less in all cases of rickets. Owing to the softness of the vertebræ and weakness of the spinal muscles and lax ligaments, the child develops a kyphosis, when sitting up, which may result in a permanent deformity if the condition is not recognized and corrected. Rachitic kyphosis presents a curved outline, involving the greater portion of the spinal column, and in its early stages it can be entirely reduced by laying the child upon its stomach and making traction on the column by means of the legs. The deformity of Pott's disease is permanent, angular in outline, and involves only a few vertebræ. Scoliosis may exist alone or in conjunction with kyphosis.

The extremities suffer from bending and twisting, as a result of muscular traction or the weight of the body. The humerus and tibia suffer most frequently.

The eruption of the teeth is delayed, and they may decay early on account of a deficiency or irregular deposit of enamel.

Rachitic children show a marked predisposition to a variety of ailments, referable to the nervous system, the alimentary tract, the skin and mucous membrane. Another notable peculiarity of rickets is its influence upon the course of acute illnesses in general—a disturbing factor, the recognition of which is of the greatest practical importance in the treatment of such cases. All of the diathetic diseases possess this modifying influence upon the type of a disease in more or less degree, but some show it more strongly than rickets.*

* "The Diathetic Diseases and Their Influence upon the Course and Treatment of the Acute Illnesses of Childhood," Hahn. Monthly, December, 1898.

Among the disturbances in the alimentary tract complicating rickets, chronic indigestion, chronic intestinal catarrh and obstipation are of the most common occurrence. The mucous membranes in general are prone to catarrhal inflammation, characterized by a tedious course, as a result of structural changes and ulceration.

The nervous system is particularly unbalanced by and highly susceptible to peripheral impulses. Trifling ailments are liable to be ushered in with convulsions, and, in fact, convulsions occurring after the first year should always lead to a suspicion of rickets. Spasm of the glottis occurs almost exclusively in the rachitic. It develops after the sixth month, and continues until the second year, being intimately associated with craniotabes.—(ELSÄSSER.)

The course of rickets is a chronic one, but the early institution of treatment, together with the favorable influence of a course of fresh air and sunshine—providing the season be suitable—will undoubtedly check the process promptly. After the rachitic state has become well established, treatment yields slower results, but its effect upon intercurrent diseases becomes more pronounced.

The *differential diagnosis* rests between *hereditary syphilis*; *hydrocephalus*; *Barlow's disease* (scorbutus), and *Pott's disease*. The differentiation of the last condition has been considered above. *Barlow's disease* is a more acute condition, most frequently found in infants of the better classes as a result of feeding on desiccated proprietary food, and it is attended by swelling of the shafts of the bones, from sub-periosteal hæmorrhage, as well as joint-tenderness and swelling, beside ecchymoses in various parts of the body. As this condition frequently becomes engrafted upon rachitis, its recognition is not unattended with difficulty.

Epiphyseal disease and separation is a symptom of *congenital syphilis*, which, however, occurs in the earliest months of life, other signs of syphilis being demonstrable.

Chronic hydrocephalus presents a head more rounded than

the rachitic cranium; the eyeballs are deflected downwards, and the mental condition is one of dullness and imbecility rather than precocity, as in rickets.

Treatment.—Prophylactic measures are to be directed to the mother during gestation, if rickets is hereditary in a given family. The child's diet is of the highest importance, avoiding the use of farinaceous food and giving a modified milk containing as much fat and proteids as the child will digest. It is not to be forgotten that breast-fed infants may develop rickets if weaning is not instituted at the proper time (before the end of the first year), in the case of delicate mothers whose milk is deficient in the above constituents.

Fresh air and sunshine are other absolute necessities for the infant, and the scarcity of rickets in rural districts and in the tropics is a strong proof of the prophylactic power of these elements.

In the early stages of rickets *calc. phos.* undoubtedly stands at the head of the list of all remedies both in the matter of frequency of indication and clinical value. The scrawny, undeveloped infant, with flabby abdomen; diarrhœal stool containing greenish mucus, undigested casein and fat particles and organic acids; delayed teething and craniotabes, closely corresponding to the incipient period of the disease.

Later on, as the osseous changes, the anæmia, local sweating about the head, glandular enlargements and distended abdomen become prominent symptoms, *calc. carb.* is more applicable. The favorite old-school prescriptions are *cod-liver oil* and *phosphorus*. Of the value of the former as a food there can be no question, but I have obtained equally good results from the use of olive-oil inunctions, while the latter, when employed upon homœopathic indications, particularly those referable to the nervous system and respiratory tract, invariably lead to most beneficial results.

Ferrum phos. is perhaps even more useful and more frequently indicated than *phosphorus*, its well-known applicability in anæmia, bronchitis, febrile conditions and acute diarrhœas making it an indispensable remedy at some period in cases of rickets.

Other remedies of importance are the following:

Alumina.—Abnormal cravings or voracious appetite; open fontanelles; distended abdomen; obstipation, from inactivity of rectum.

Bell.—The nervous manifestations of rickets frequently call for this drug.

Kali hydroj.—Preliminary symptoms of rickets. Tenderness of the entire body, but especially about the head. —(COOPER.*)

Mercurius.—Syphilitic history; large head and open fontanelles; offensive, oily perspiration; glandular enlargements; tendency to catarrhal affections with ulceration; curvature of the bones.

Natr. mur.—Emaciation of the neck and thighs; anæmia; slight pliability of bones.

Silicea.—Profuse sweating about the head and chest, with general sensitiveness of the body; anæmia; pale skin through which the bluish veins are prominently seen; swelling of the epiphyses of the bones and affections of the cartilages in general; skin dry and scaly, with tendency to suppurative affections, notably paronychia. *Silicea* is really one of the most important remedies in rickets, standing on the same plane with the *calcareas*, from which it must be carefully differentiated.

Sulphur may be indicated at any period either as an intercurrent to stimulate reaction to treatment, or its employment may become necessary over an extended period of time from the persistence of characteristic symptoms of this drug.

*. "Clinical Lectures upon Diseases of the Ear."

Infantile Scurvy ; Barlow's Disease.

Scurvy is a constitutional disease resulting from faulty nutrition, the infantile type of which assumes an acute course, with a superficial resemblance to rickets, for which reason it was formerly described as *acute rickets*. The disease is most liable to develop between the ages of seven and fourteen months, although it has been seen at a much earlier period, one reported case being but four weeks old.* The patients in which it is observed belong to the better classes, and it is found in the country as well as in the city—etiological factors quite the reverse in rickets. The immediate cause is improper feeding, the composition of the food being directly responsible for the development of the disease. Although it has been claimed that sterilizing or boiling the food is in itself a cause for scurvy, there is not sufficient evidence to establish this as a fact; for cases of scurvy developing in children thus fed depend more upon the character of the food employed than upon the manner of its preparation. It is almost invariably found that some form of proprietary food has been used either as a desiccated or a preserved preparation. The most rational explanation of the development of scurvy, based upon these data, would seem to be that it is a chronic ptomaine poisoning, the ptomaines being derived from badly-preserved foods—a view held by Dr. Nansen,† and also expressed in the American Pædiatric Society's report upon the subject.‡

Symptomatology.—The characteristic symptoms of scurvy in infancy are anæmia; sponginess and bleeding of the gums; subperiosteal hæmorrhages, notably of the lower extremities; general sensitiveness of the body, and pseudo-paralysis of the extremities.

The early manifestations of scurvy are a moderate amount of fever and painfulness of the extremities, notably

* "Amer. Pædiatric Soc. Report of Infantile Scurvy," North Amer. Med. Record, July, 1898.

† "Med. Chronicle," September, 1897.

‡ *Loco cit.*

about the epiphyses of the bones. The child usually shows a rachitic tendency or actually has rickets, although the two conditions are entirely distinctive. The gums are swollen, and may show petechial spots beneath their mucous membrane, or there is bleeding around the teeth. The eyelids are often œdematous, but cutaneous hæmorrhages are rare.

The knee- and ankle-joints may become considerably swollen and exquisitely tender, with discoloration of the skin. Swelling of the shafts of the tibia and femur can be elicited by palpation in severe cases.

The course of scurvy is an acute one, and under proper treatment it can be shortened to a few weeks. Fatal cases have occurred, especially in those whose true nature was not recognized in time.

The *diagnosis* is not difficult when the characteristic symptoms have developed, although it can readily be confounded with *acute articular rheumatism* in the early stages.

Treatment.—In the treatment of scurvy a change of food is demanded first of all. A milk formula suitable to the child's age, properly Pasteurized, and fed in definite quantity and at regular intervals, together with the administration of fruit-juice (two or three teaspoonfuls of orange-juice twice daily), are the dietetic requirements. Fresh-meat juice can also be given at regular intervals if anæmia and prostration are marked.

Constitutional remedies are of the greatest value, particularly so when a strong rachitic tendency is present. The child's suffering can also be alleviated by remedies of an acute type, such as *agave Amer.*, *ferrum phos.*, *bryonia*, *rhus tox.*, *ruta* and *mercurius*. Deschere* reports a case in which *calc. carb.* was prescribed upon the indications of profuse perspiration about the head and neck during sleep, sour odor from the mouth, and frequent, offensive urine, with immediate improvement of the condition.

* "Barlow's Disease," N. Amer. Jour. Hom., September, 1897.

Scrofula.

Scrofula in its fully-developed state is a chronic tuberculosis of the lymphatics; yet the scrofulous diathesis and many of its leading clinical manifestations may be demonstrated in case after case without the presence of any tuberculous lesions. The general nutritive disturbance underlying the development of scrofula is responsible for the hyperplasia and inflammation of the lymphatic glands, the tendency to catarrhal inflammations of the mucous membranes and to skin eruptions and the vulnerability of the lymphatics and bones inviting local inflammations of a tuberculous nature.

The entire system shows a strong predisposition to local inflammations which readily become infected with tubercle bacilli and assume the scrofulous type, characterized by a chronic course and excessive cell-proliferation, with tendency to caseation and more or less permanent cellular infiltration. These inflammations are localized and are frequently the focus of a general infection with acute tuberculosis, one of their most dangerous features, especially so when located in the lymphatic glands.

In the *etiology* of scrofula, as well as in every diathetic condition, heredity plays the most important rôle. Parents who have themselves been scrofulous, or are tuberculous, give birth to children in whom the morbid tendency soon becomes apparent. So likewise carcinoma, syphilis, parental old age, or marked difference in the ages or close blood relationship of the parents, have been looked upon as etiological factors. Acquired scrofula may result from unhygienic surroundings, especially when combined with improper feeding. The early abstraction of mother's or cow's milk from the child's dietary and a substitution of starchy foods is a potent factor in the production and sustaining of scrofulous manifestations.

The division of scrofula into two types, described as the *erethitic* and the *phlegmatic*, is liable to produce confusion,

as the former represents the purely tuberculous diathesis, possessing none of the features of scrofula, but a strong tendency to the development of tuberculous affections of a rapid course and extensive distribution.

The *phlegmatic type* of scrofula, the true scrofulous diathesis, is characterized by large frame; large, coarse features; large, protruding upper lip, due to hyperplasia of the glandular structures and inflammatory infiltration of the connective tissue (HENOCH); coarse, doughy skin with abundant subcutaneous fat; large, distended abdomen; enlarged lymphatic glands in the cervical and other regions; eczematous eruptions. The muscular system is feeble, the pulse soft and weak, and the temperature often subnormal from deficient oxidation of tissue.

Scrofula develops most frequently toward the end of the first dentition period. With the advent of puberty its active manifestations disappear, although in exceptional cases individuals may remain scrofulous for a much longer time.

The lymphatic glands which most frequently become infected with tubercle bacilli are the cervical, bronchial and mesenteric groups.

They become enlarged from multiplication of the cellular elements and hyperæmia, later undergoing caseation or abscess formation. Simple hyperplasia results in the superficial lymphatics from irritation of the skin or mucous membrane, or from the absorption of infectious material in diseases of the tonsils, ears or teeth.

Disturbances in the mucous membranes are characterized by hypersecretion, the secretion being irritating and offensive, inducing eczema and lymphadenitis in adjacent parts. Catarrhal affections are chronic in their course, and the naso-pharyngeal adenoid structures, as well as the tonsils, are hypertrophied. The dangers to the scrofulous child are ophthalmia and otitis. In the former, permanent injury to the cornea may be anticipated, while in the latter

life is immediately at stake, for tendency to caries of the temporal bone carries with it the possibility of a future cerebral abscess.

The skin is principally attacked with impetiginous eczema; beside this, lupus, prurigo and lichen are encountered.

Affections of the joints are as a rule provoked by a traumatism, and the resulting inflammation may end in destruction of the joint. Scrofulous changes in the bones show themselves as a fungous osteitis or periostitis, the vertebræ, phalanges, the head of the femur and the lower end of the tibia being most frequently affected. These processes are purely tuberculous in nature, being invited by the peculiar vulnerability of tissue belonging to scrofula.

Beside the above conditions the scrofulous diathesis predisposes to croup, hydrocephalus and general tuberculosis, and it is claimed that the majority of children dying of these affections are scrofulous. For this reason the *prognosis* in scrofula must always be a guarded one; and although the natural course of the disease is toward spontaneous recovery at puberty, even tuberculosis of the lymphatics and tuberculous osteomyelitis being in most instances within the control of medical and surgical treatment, still the tendency to infection with general tuberculosis and the cachexia and amyloid changes in important viscera resulting from prolonged suppuration must always be borne in mind as grave complications.

The *diagnosis* of scrofula rests upon a recognition of the diathesis already described and the characteristic lesions found in the lymphatic glands, the skin, mucous membranes and bones. As these localities are also affected in a specific manner by syphilis, the differential diagnosis rests between these two diseases. A careful comparison of hereditary syphilis and scrofula must, however, remove any doubt as to the nature of a given case. Thus, for example,

the rhinitis of syphilis develops in early infancy; it is accompanied by ulceration and destruction of the nasal septum, a result never obtained in scrofulous coryza. The symmetrical, mixed lesion of the skin, the moist condylomata and fissures of syphilis, are, again, quite distinct from the scrofulodermata, and the osseous changes appear as osteoperiostitis of the long bones, notably affecting the tibia and osteochondritis of the epiphysis, never resulting in caries and destruction of joints, as in tuberculous osteitis.

Treatment.—Children showing a predisposition to the development of scrofula must be put under a strict anti-scrofulous regimen of hygiene and diet. In the prophylaxis and moderating of scrofulous manifestations an out-of-door life, particularly a sojourn at the seashore, and a diet consisting mainly of milk, eggs, meat, and cod-liver oil, play the most important rôle.

The remedies indicated upon constitutional peculiarities are the *calcareas*, *mercury*, the *iodides*, and such other deep-acting drugs as *silicea*, *sulphur* and *baryta*.

For the tuberculous lesions of the glands and bones I know of no remedy which will yield the prompt and positive results obtained from *iodoform*. Administered in conjunction with the proper surgical treatment of such cases it hastens healing and prevents recurrence and extension of the process. The empirical use of *iodoform* in a large number of scrofulous subjects has also demonstrated its efficacy in checking glandular swellings and preventing their breakdown; and a severe case of tuberculous osteitis of the tibia under my care, in which radical surgical measures combined with the administration of apparently well-indicated remedies (*phosphorus*, *silicea* and *aurum*), failed to benefit the patient in the slightest degree, was cured by *iodoform*. Outside of its local action it seems to improve the patient's general condition, and especially increases the appetite. I begin with the third decimal, later substituting one of the higher triturations.

The symptomatology of the following remedies demands especial consideration.

Arsen. iod..—Catarrhal discharges of an irritating and persistent character; debility; tuberculosis of the bronchial glands and lungs.

Aurum met..—Caries of the bones; fœtid otorrhœa and caries of mastoid process; retarded puberty.

Baryta carb..—The *baryta carb.* child is dwarfed both in body and in intellect. The glandular swellings are characterized by stony hardness. Beside this, enlarged tonsils and dry, scaly skin eruptions are prominent symptoms of the drug. The *iodide of baryta* is preferable in the throat affections of scrofulous children, although *calc. phos.* is more useful than either of these salts in the majority of cases.

Bell..—Acute symptoms of a scrofulous type referable to the eyes, ears, throat, lymphatics, etc.

Calc. carb..—This remedy, which represents the leucophlegmatic temperament, gives us a perfect picture of scrofula in many of its phases. The catarrhal discharges from the nose, eyes and ears are offensive and irritating in character, and produce eczema and lymphadenitis in adjacent parts. The ophthalmia is very prone to become complicated by ulcerative keratitis, or phlyctenulæ make their appearance independently; the otorrhœa may lead to caries of the temporal bone, and this, in turn, brings with it the danger of a cerebral abscess. The skin is dry and generally unhealthy, eczema developing from slight irritation, while suppuration readily sets in after an injury. The lymphatics become enlarged and tend to break down. The child is fat and pot-bellied, the latter condition depending upon intestinal torpor and enlargement of the mesenteric glands, which can be felt as large lumps. Other symptoms frequently observed and strongly indicative of *calc. carb.* are craving for eggs; crusta lactea; retarded dentition; constipation with chalky stools, and ascarides.

Calc. phos. possesses more of the true tuberculous ele-

ment in its symptomatology, the child being emaciated and of a less sluggish type of constitution. The stools are especially important, being loose and offensive, and containing greenish mucus and undigested food-particles, hinting at intestinal tuberculosis. Caries of the bones has also been benefited by *calc. phos.*, and it stands in close relationship to *iodoform* in both its intestinal and osseous disturbances. The *iodide* and *fluoride of lime* are also important remedies in their particular sphere.

Graphites is one of the most useful remedies for the scrofulous skin affections, particularly when of the moist variety, with tenacious, yellowish exudations, accompanied by induration of the superficial lymphatics.

Hepar sulph., together with *mercurius* and *silicea*, is required in the suppurative conditions of scrofula. *Silicea* is indicated in caries of the vertebræ and long bones when fistulous tracts have formed (*calc. sulph.*), and the pus is thin and offensive. The *silicea* child is pale and emaciated, the skin is thin and transparent, and the veins show through prominently. There is a strong tendency to the development of general tuberculosis, particularly when a local focus for infection is present.

Phosphorus.—Thin, watery pus oozing from the diseased joint; hectic fever; chronic diarrhœa; nervous temperaments. Similar to *silicea*, although the *silicea* child is more apt to be of a fair complexion, presenting the anæmia and lack of animal heat so characteristic of the drug.

Rhus tox. and *stramonium* are the main remedies in the early stages of hip-joint disease, *rhus* being most applicable for the right and *stramonium* for the left side.

Sulphur.—Dry, dirty, unhealthy skin; irritating catarrhal discharges; blepharitis; aversion to being washed; alternate diarrhœa and constipation; eczema and prurigo; emaciation, with voracious appetite.

Other remedies of importance which may be indicated on special symptoms are *æthiops ant.*, *alnus rub.*, *asafœtida*,

badiaga, bromium, caust., conium, hecla lava, hydrastis, iodium, kali bichr., lycopodium, petroleum, psorinum, theridion.

Surgical treatment resolves itself into extirpation of diseased glands, the proper orthopædic appliances, and removal of diseased areas of bone with the curette when the parts are accessible. Of late, the treatment of tuberculosis of the glands and bones with injections of *sapo viridis* has met favor with some orthopædists.

Tuberculosis.

Tuberculosis in infancy and childhood presents itself in widely different clinical types; and as it may become a local as well as a general disease, it becomes necessary to describe many of its local manifestations under separate headings. Thus, tuberculous broncho-pneumonia and chronic pulmonary tuberculosis are conditions described under the affections of the lungs; tuberculous meningitis belongs distinctively to the nervous diseases, tuberculous ulceration of the bowels to diseases of the intestines, and the glandular and osseous lesions belong to scrofula. Still, each one of these affections is tuberculosis pure and simple; and in order to appreciate the full meaning of tuberculous disease as it occurs in childhood, it becomes necessary to study it as an infectious disease resulting from the *bacillus of Koch*. It is noteworthy that infection almost invariably occurs in subjects presenting the *tuberculous diathesis*, a constitutional predisposition to the development of tuberculous processes of a general distribution and more or less rapidly fatal course, resulting from transmitted hereditary tendencies, and reinforced by unhygienic and unfavorable surroundings. The question of diathesis is, therefore, a most important one, as its recognition offers suggestions immediately for both prophylaxis and treatment, as well as for prognosis. The tuberculous processes invited by the scrofulous diathesis are of a localized and chronic form, quite apart from those invited by the purely tuberculous diath-

esis. In the latter, tuberculous processes in the lungs, brain and intestinal tract, or a general infection, are to be anticipated. Generalized tuberculosis is the most frequent type encountered in young children, infection taking place through the respiratory tract, the bronchial glands being attacked first, whence the process may reach every portion of the body through the channels of the lymphatics, the blood-currents, and through auto-infection from swallowing bacilli-laden expectoration. In older children its manifestations more closely approach the clinical course pursued in adults.

Primary infection through the respiratory tract is the most frequent mode of entrance of the bacilli into the system in infancy as well as in later childhood; and although primary infection may take place through the alimentary tract from an infected food supply (milk from a tuberculous cow or from a tuberculous mother), still this is by no means as common as was formerly taught. Nevertheless, the necessity for sterilizing the child's food and of weaning it from a tuberculous mother remains just as imperative as ever.

Cases of congenital tuberculosis are on record, the mode of transmission being through the blood-current. A latent form of tuberculosis is accepted by Baumgarten. In this the germs are supposed to be present in the tissues from the time of birth, not developing until favorable conditions, such as a trauma or an acute illness, supervene.

The rôle of heredity in the etiology of tuberculosis is, therefore, twofold. The disease may be transmitted directly, which is exceedingly rare, or the child is endowed with the tuberculous diathesis, a frailty of constitution which predisposes its tissues to the ravages of the tubercle bacilli. Beside this, the child constantly breathes an atmosphere contaminated by the breath and sputum of the mother or of the several members of the household in whom the disease is active. It is, therefore, no wonder

that tuberculosis was so generally believed to be a hereditary disease before the true causative agent and its mode of transmission were discovered.

The large death-rate among infants from tuberculosis is appalling, the following statistics indicating the prevalence of this disease in early life. Comby,* found tuberculosis in 12 per cent. of a series of 235 autopsies upon children up to the age of two years. None of these cases were under three months, showing the relative rarity of the disease in extreme early life—a strong point against direct hereditary transmission. Osler† quotes Miller's statistics from the Munich Pathological Institute, in which 150 cases in 500 were tuberculous. At the New York Infant Asylum 8 per cent. of the cases were tuberculous, and in the Babies' Hospital 14 per cent.—(HOLT.‡) The last statistics indicate that tuberculosis is not so frequent here as on the Continent.

Pathology.—The morbid anatomy of tuberculosis demonstrates that the tubercle is not the single lesion indicating a tuberculous process. Although it is the typical product of an infection with Koch's bacillus, yet another condition is frequently obtained, particularly in the lungs, where fusion of scattered areas of infection through exudative products and cell-proliferation in the alveoli result in large consolidated areas—the so-called tuberculous pneumonia. Again, the process may not rest with the formation of tubercles, a reactionary or secondary inflammation resulting in adjacent parts. In the lungs such an extension of the process shows itself as bronchitis and pibronchitis of the smaller tubes with catarrhal or fibrinous pneumonic areas.

The termination of a tuberculous process is destined to become one of degeneration through coagulation—necrosis of the cellular elements—caseation. The lymphatic glands

* "Klinische Therap. Wochenschrift," 1898.

† "Amer. Text-Book of the Diseases of Children."

‡ "Diseases of Infancy and Childhood."

break down, and caseous pneumonic areas and cavities are formed in the lungs as the result of this necrosis. In those clinical types characterized by a preponderance of the tuberculous process in the meninges of the brain such a result is never obtained, owing to the rapidly fatal nature of the lesions. The other extreme—calcification of caseous lesions—is sometimes seen.

The virulence of the bacilli seems to exert an influence upon the nature of the lesions produced. Thus, Dr. Woodhead* found that in feeding pigs with milk containing tubercle bacilli, subjected to heat, but not sufficiently high to entirely destroy the vitality of the germs, a modified form of tuberculosis was produced, in which the lymphatic glands and the joints were principally affected—a condition analogous to scrofula in children.

Symptomatology.—The clinical course of general tuberculosis depends upon the locality principally affected. As the bronchial glands are oftenest the seat of primary infection, the pulmonary type of the disease is the commonest encountered. But the thoracic condition may remain unrecognized until revealed by autopsy in cases presenting a preponderance of cerebral or intestinal symptoms. Meningitis occurs next in frequency to the pulmonary form, and although intestinal lesions are commonly found in conjunction with tuberculous disease elsewhere, they rarely exist as a single condition.

General tuberculosis may be divided into the apyretic form, of a subacute or chronic course and diffuse distribution, and the febrile form, which presents typhoid, pulmonary and cerebral symptoms with special predominance. It is also described as *acute miliary tuberculosis*.

Children of the tuberculous diathesis show a peculiar habitus indicating a delicacy of constitution with low resisting power against tubercle invasion. This diathesis is

* Cautley, "The Feeding of Infants."

hardly recognizable in early infancy, but it becomes especially prominent during the period of childhood proper, at which period tuberculosis runs a somewhat different course than during infancy, being more limited in its distribution and appearing as a purer clinical type. This is exemplified in the great prevalence of distinct cases of tuberculous meningitis, tuberculous broncho-pneumonia, tabes mesenterica, tuberculous osteitis and adenitis at this age.

The diathetic characteristics are a delicate, frail appearance; small, slender bones; slight muscular development; transparent skin, through which large blue veins are prominently seen; soft, silken hair; long eyelashes; bright, languid eyes; oval face. They are of a passionate and lovable disposition, and the mind is active and precocious. In such children it requires but a slight provocation in the form of an acute illness, among which measles and whooping-cough stand most prominently, or a local catarrhal condition of the respiratory tract, to invite the outbreak of tuberculosis.

(a) The *febrile form* of tuberculosis runs a rapid course, terminating fatally in from three to six weeks. The starting-point of the general infection is a local focus, the most common seat of which, as above stated, is the bronchial glands. Acute miliary tuberculosis is more common in infants than in children and adults. In its early stage it is not suspected, as the child shows no characteristic symptoms excepting a febrile disturbance and perhaps a bronchial cough. In the true typhoid type the systemic infection is the most pronounced condition, local manifestations being proportionately slight in comparison to the grave toxæmia.

With full development of symptoms the fever runs high and assumes a remitting type, the remissions occurring in the morning hours, as a rule. The tongue is furred and dry, and the lips may become cracked and bleeding. Hydroa develop in abundance in some cases. Diarrhœa, with distended abdomen, enlargement of the spleen and

albuminuria, are common symptoms. The urine gives the diazo reaction of Ehrlich, as in typhoid fever. The child becomes apathetic and stupid, and gradually sinks into a state of coma and collapse, or death results from a terminal broncho-pneumonia or meningitis.

The meningeal type is preceded in its onset by characteristic nervous disturbances, such as irritable mood, constipation, cerebral vomiting, squinting and headache, and during its entire course there is a predominance of nervous phenomena. A tuberculous meningitis may run a pure clinical course throughout, or it may arise during the course of a general tuberculosis, thus only modifying the type of the disease. The same may be said of the pulmonary type, in which there is a predominance of the manifestations of an acute tuberculous broncho-pneumonia. The development of a tuberculous broncho-pneumonia is invited by the acute infectious fevers, especially when they attack children of the tuberculous diathesis. Measles, whooping-cough, influenza and typhoid fever are especially dangerous. As broncho-pneumonia so frequently complicates these fevers, the greatest care must be exercised in managing such cases. The picture is a familiar one, as it is seen but too often. An ordinary broncho-pneumonia becomes tedious; the temperature remits, leading us to suspect a malarial condition or even typhoid fever; but the case continues, in spite of our best-directed efforts, towards a fatal termination.

(b) The *afebrile form* is a chronic, diffuse tuberculous process, affecting the different organs and tissues. It is the most common form of tuberculosis in children, and furnishes those lingering, emaciated cases which crowd the wards of hospitals and foundling asylums, and which are seen in the slums and dispensary clinics so numerous. The lesions are found in the lungs, spleen, liver, bronchial and mesenteric glands, intestines, kidneys and brain. In the lungs large areas of caseous pneumonia and large caseous or sclerotic tubercles are found; the bronchial and mesenteric

glands are much enlarged, and when cut present a caseous and broken-down interior. The spleen and kidneys and the capsule of the liver are studded with miliary tubercles in different stages of development, and the brain may show coarse tuberculous deposits on its posterior surface or a terminal acute miliary meningitis.

The symptoms of chronic diffuse tuberculosis are those of progressive wasting, with here and there manifestations of a local disturbance due to the above-described lesions. It may develop idiopathically or follow an acute disturbance. Cough, indigestion and persistent diarrhœa may be present, or the child may be constipated and have a voracious appetite, at times manifesting promising signs of recovery, only to fail entirely sooner or later. As in the acute form, there may be a predominance of symptoms referable to the organs principally attacked; thus, a thoracic, abdominal and cerebral type can be distinguished. The tuberculous child is extremely emaciated, the chest is small and poorly developed, and the belly is large and prominent. These features, taken together with the wasted limbs, the flabby, shrunken skin, and the bright, precocious expression of the face, make up a clear-cut picture not so easily confused with other types of disease. Fever is not necessarily present, febrile disturbances usually resulting from extraneous influences.

Physical examination reveals areas of consolidation and sometimes cavities in the lungs, enlargement of the liver and spleen and of the mesenteric glands. The tuberculous processes in the lungs are not confined to the apices, as in adults, being scattered in distribution and more difficult to recognize and demonstrate clinically.

The disease usually terminates fatally within a year from its onset, especially in the advent of a complication in the form of an acute illness. Life can be prolonged by careful treatment and hygienic measures, but the prognosis is less favorable than in the purely localized forms of tuberculosis occurring later in life.

Diagnosis.—The diagnosis of the febrile form is difficult in the absence of visible indications of tuberculosis, such as tuberculous adenitis and bone affections, or a clear-cut tuberculous family history. From typhoid fever it is to be distinguished by the irregular and remitting type of temperature, the absence of rose-spots, and the prolongation of the fever beyond the third week to a fatal termination. The chronic or apyretic form simulates marasmus and congenital syphilis to a degree; but here again the family history and the characteristic lesions of the skin and mucous membranes belonging to syphilis, and the old, withered look and gastro-intestinal disturbances of marasmus serve to distinguish these affections from tuberculosis.

Treatment.—The treatment of tuberculosis is hygienic, and, as far as remedial agents are concerned, nothing is to be expected from them more than to palliate and ameliorate symptoms as they arise. It is true, cases of tuberculosis of a benign type have terminated in spontaneous recovery through self-limitation of the process, and authentic cases have been controlled with well-selected remedies; nevertheless, this is an exceptional result which should never be promised or confidently expected.

Acute miliary tuberculosis is universally conceded to be beyond the pale of medical skill, and in its treatment the remedies recommended under *Typhoid Fever*, *Broncho-Pneumonia* and *Tuberculous Meningitis* are to be chosen from to meet arising conditions. A wider field of usefulness in medicines is found in the chronic form, in which life can be prolonged and suffering much relieved by carefully-selected remedies, choosing from among those having a decided action upon the general nutrition, and those capable of controlling catarrhal conditions. *Iodine* in its compounds, especially the *iodides of arsenic, antimony and tin*, and *iodoform*, unite both of these features. Beside these remedies, *hepar sulph. calc.*, *lycopodium*, *sulphur*, the *calcareas*, *tartar emetic* and *phosphorus* are frequently indicated for the

bronchial and general constitutional symptoms. In the abdominal type of tuberculosis the *iodide of arsenic* is a most valuable remedy, both for the glandular swellings and the diarrhœa, and ample clinical reports are extant to verify the utility of this drug. *Iodoform* (3x to 12x trit.) has, however, given me such promising results in all tuberculous conditions, notably in the presence of glandular enlargements, and in chronic diarrhœa of greenish, watery, undigested stools, a symptom which I have frequently developed in provings upon children, the diarrhœa being accompanied by an irritability of temper, that I give this remedy the preference above all others in these cases. *Calcareæ phos.* is quite similar in its symptomatology, and covers the above-mentioned condition in children of the *calcareæ phos.* type of constitution. *Tuberculinum* has been used with considerable success by a number of physicians. For its indications and mode of administration see under the treatment of *Broncho-Pneumonia*, p. 159, and *Phthisis*, p. 168.

Feeding, climate and hygiene require careful consideration. An abundance of fresh air and sunshine is an absolute necessity both as a prophylactic against the development of tuberculosis and as an element in the successful caring for these cases. Where circumstances permit, the child should be taken to an equable and dry climate, not necessarily mountainous—the stimulating climate of the seacoast being very beneficial in cases not principally pulmonary in type. Liberal feeding is a most important element in the treatment; a highly nutritious but easily digested form of diet is to be selected, and fat administered freely to check the abnormal tissue-waste. Cod-liver oil, when it does not disagree, is the best form of fat; marrow fat, olive oil, butter and cream are desirable substitutes when called for. Infants often do best when the oil is administered by inunction. The milk formula should be adjusted to meet the infant's digestive powers, the amount of fat and proteids being regulated according to the condi-

tion of the stools, the tolerance of the stomach and the degree of satiety obtained from the food, endeavoring to keep the percentages of both ingredients as high as is compatible with the case. Eggs, scraped beef, meat-juice and fresh vegetables, beside the various cereals and thoroughly ripened fruits, particularly grapes, are allowable in older children in the absence of gastro-intestinal disturbances.

Rheumatism.

The rheumatic diathesis is an inherited predisposition to certain forms of articular and abarticular phenomena in association with general and constitutional disturbances characterized by retardation in the process of nutrition. Although closely allied to gout and its manifestations, rheumatism must be distinctly separated from this diathesis, to which it bears but a superficial resemblance. Its acute expressions are being recognized more and more as the result of a specific infection.

Clinically, rheumatism may be divided into three classes: "1, articular rheumatism; 2, rheumatism of other organs, either external or internal, constituting what may be called abarticular rheumatism; 3, general, diffuse, non-circumscribed rheumatism."* To the first class belong acute and chronic articular rheumatism; to the second the rheumatic affections of the skin, vascular apparatus, muscular system, respiratory tract, digestive tract and nervous system, many of which are localized and clearly recognizable as rheumatism. The general, non-circumscribed affections present an array of symptoms referable to the internal organs and nerves which, although not so sharply defined and readily classified as the other forms, still offer strong indications of this dyscrasia. Among them, chorea and hemicrania; rheumatic neuralgia and neuritis; intestinal indigestion and chronic diarrhœa, and catarrhal affections in general, represent the important conditions encountered.

* Lyman, "Amer. Text-Book of Practice."

Etiology.—In the etiology of rheumatism heredity stands as the predisposing factor. Chilling of the surface by exposure to cold, or a wetting, or a sudden change of temperature, acts as the exciting cause. The actual cause for the pathological changes is still a moot question, and the infectious, the neurotic and the lactic-acid theory still have their advocates. Lactic acid, it is well known, acts as an irritant when present in excess in the blood; and, although the claims of Richardson in regard to the artificial production of endocarditis in dogs by the injection of lactic acid have not been substantiated (CHEADLE), still there is no doubt that some of the phenomena of acute rheumatism are caused by excessive formation of the acid in the system.—(MACLAGAN.*) The question arises, How is the excessive formation of lactic acid accounted for? Alfred Mantle considers it a ptomaine produced by the micro-organisms found in the blood of rheumatic patients; and, according to his experiments and those of Klebs, Cornil and Babes, the introduction of these micro-organisms into sterilized milk has resulted in the production of lactic acid.—(COBB†.) Viewed in this light, lactic acid is seen to be a result of rheumatic infection, and not a primary cause for the disease. The latest neurotic theory, as advanced by Bigler,‡ defines the rheumatic diathesis as “an abnormal state of unstable equilibrium in the thermogenic mechanism, the result, in the individual or his ancestors, of too frequent or too prolonged stimulation by variations in the temperature to which they have been exposed. . . . Exposure to cold of any kind, if not continued too long, will not be followed by symptoms of rheumatism in those not predisposed; whereas, in the presence of the same cause, in the case of those whose thermogenic mechanism is in a state of un-

* “Twentieth Century of Practice.”

† “Trans. Am. Institute of Hom.,” 1897.

‡ “The Pathology of Rheumatism,” Trans. Amer. Institute of Hom., 1897.

stable equilibrium, the reaction will become excessive, and the effects will first show themselves in the prodromal symptoms which characterize the onset of acute rheumatism." He further endeavors to show how continued reaction leads to pyrexia, excessive metabolism and excessive fibrin and lactic acid formation, which in turn cause further disturbances. The theory is learned and ingenious, but it does not explain the pathological changes of rheumatic fever, and particularly does it fail to account for the close relationship existing between rheumatism and endocarditis, the latter condition being established without all peradventure as infectious in origin. Of the lesions of rheumatism Eichhorst so timely says, "He who has seen post-mortem examinations of acute articular rheumatism is surprised how strongly the impression obtained at the corpse calls forth an infectious disease; hæmorrhages into the various organs; cloudy swelling in the heart, liver and kidneys; large, soft spleen, etc."* Further evidence of its infectious nature is seen in the epidemic appearance of the disease and its occurrence as a house disease, Edlefszen reporting 728 cases to 492 houses. Direct hereditary transmission is another clinical fact substantiating this view, several authentic cases being on record. As to the bacteriology, nothing positive has yet been learned. Mantle† has demonstrated the existence of micrococci and bacilli in the blood and serous effusions, while Singer‡ found staphylococci and streptococci in the urine. He considers the tonsils as the point of entrance of the infection, their anatomical structure and frequent inflammation as an initial symptom of rheumatic fever offering the grounds upon which this view is based. The miasmatic origin of rheumatism is maintained by MacLagan,§ who likens it to a

* "Handb. der Speciellen Path. u. Therap."

† "British Med. Jour.," 1887.

‡ Osler, "Practice of Medicine."

§ "Twentieth Century of Practice."

malarial infection. The relationship of scarlet fever to rheumatism is noteworthy, painful swelling of the joints, with or without endocarditis, not infrequently developing during the course of the fever. It is not positively known whether the scarlatinal virus in these cases incites an arthritis and endocarditis indistinguishable from rheumatism, or whether it only precipitates a rheumatic inflammation in these parts, the former theory being the most plausible one.

Symptomatology.—In describing the phenomena of acute rheumatism the term *rheumatic fever* is most appropriate, as it includes both the manifestations of the articular and abarticular form of the disease. Particularly does this apply in the case of children, in whom involvement of the joints is by no means an essential requirement; in fact, absence of joint involvement is one of the peculiarities of rheumatism of children. An endocarditis or pericarditis, or an acute inflammatory affection of the pharynx or respiratory tract, is at times the only indication of an attack of rheumatism. Urticaria, erythema, fibrous tendinous nodules and chorea are likewise frequent manifestations of the rheumatic diathesis.

Acute articular rheumatism is usually of gradual onset, a moderate fever accompanied by tenderness and slight swelling of several joints indicating the nature of the complaint. Neither are the joints as highly inflamed and swollen as is the case in adults, nor is the fever so high and abrupt in its onset. The joints most frequently involved are the ankles, knees and wrists, but there is not that wide distribution of arthritis found later in life. The hip may be affected together with the knee, and closely simulating the symptoms of tuberculous hip-joint disease. I have seen such cases also mistaken for appendicitis and psoas abscess, owing to the fixation of the limb, pain, and fever; here, however, the discovery of other sensitive joints and endocarditis, and a careful local examination, will readily indi-

cate the correct diagnosis. No wonder that a serious endocarditis so often gains full sway before it is suspected, when we consider how great the liability to error and how slight the indications of the true nature of the case are in so many instances. For this reason it is well to investigate carefully the ordinary colds, fevers and growing pains of children in order to determine their true nature, particularly when they occur in rheumatic families.

An attack of articular rheumatism runs a course of from two to three weeks under proper treatment and in the absence of complications. In a general way, it may be said that rheumatism shows a tendency to attack more extensively the tissues of the growing child, and to manifest itself over a longer period of time than in adults.

Endocarditis may exist alone as a symptom of rheumatism, or accompany the articular forms, whether severe or mild. If it is discovered as a primary condition, arthritis or chorea, particularly the latter, frequently follows in its wake. Noteworthy to mention is the strong relationship supposed to exist between the development of *fibrous tendinous nodules* and a progressive endocarditis. They were first described by Barlow and Warner.* These nodules are mainly found about the joints, most commonly at the styloid process of the ulna, above the olecranon, and along the tibia and malleoli. In structure they are found to consist of fibrous tissue with an admixture of fibro-cartilage.† Notwithstanding a careful search for these nodules in every case of rheumatism and endocarditis in children coming under my observation, they have been but rarely found, and consequently of little service in diagnosis.

Pericarditis is rarer than endocarditis, more commonly of the dry form, and more difficult to recognize than endocarditis. There is, however, more pain than in the latter, and, in the advent of effusion, more dyspnœa.

* Ashby and Wright, "Diseases of Children."

† Mayer, "Berliner Klin. Wochenschr.," 1882.

Tonsillitis represents one of the types of rheumatic inflammation, and it is a common affection of rheumatic children. The inflammation is severe; the attacks show a strong tendency to recur, and the accompanying fever depends upon the local condition. Involvement of the endocardium is possible. These are the features of all rheumatic inflammations, and beside tonsillitis the children of this diathesis are subject to *rhinitis*, *pharyngitis* and *sibilant bronchitis*, any of which may develop from apparently the slightest provocation.

Pleurisy and *pneumonia*, especially the former, are at times of rheumatic origin. In the occurrence of an ordinary pneumonia, extension to the pleura and pericardium are invited by the rheumatic diathesis, rendering this disease particularly dangerous to children in whom the diathesis is well marked.

Muscular rheumatism is only common in the form of *torticollis*, other groups of muscles being rarely affected in childhood.

The *cutaneous* symptoms indicating rheumatism are the various forms of erythema, urticaria and purpura rheumatica. They may occur alone or appear in connection with other local manifestations of the disease. Some chronic forms of skin disease are also dependent upon the rheumatic diathesis, and by directing attention to diet and selecting a rheumatic remedy many intractable cases of infantile eczema are speedily relieved.

Anæmia is a direct result of rheumatism, and children who have been repeated sufferers from any of the above manifestations, exhibit a high degree of anæmia.

Chorea, *hemicrania* and *gastralgia* are among the prominent nervous disturbances resulting from the action of the rheumatic poison upon the nervous system. Especially in chorea has the intimate relationship of the two conditions been so clearly demonstrated that little doubt remains as to the etiology of the majority of cases of chorea. Quite often

other strong indications of rheumatism are present in these cases, among which endocarditis stands most prominently. Chorea bears the same relationship to rheumatism in children which some cases of mania represent in adults.

Chronic rheumatism.—Many of the foregoing conditions are chronic in their course or lead to pathological changes of a chronic nature, yet by chronic rheumatism proper is understood the chronic articular form. It is a rare disease of childhood, resulting from an injury to a joint in the presence of a strongly-developed rheumatic diathesis, or through incomplete resolution or the products of an acute inflammatory attack. Disability from muscular contractures is also liable to occur in rheumatics, particularly after strains or other injuries to a joint. Chronic rheumatic arthritis is prone to become tuberculous.—(WRIGHT.)

Treatment.—For those of the rheumatic inheritance much can be accomplished in the way of prophylaxis. Careful attention to the matter of clothing the child, having it wear flannel undergarments, and especially avoiding wetting of the feet and exposure in damp weather, is of the highest importance. The great danger which threatens these children is cardiac involvement. Constitutional remedies will do a great deal toward erasing the tendency to rheumatic attacks and mitigating their severity. *Benzoic acid, calc. carb., lycopodium, causticum, kali hydrojodicum, mercurius, silicea, sulphur* and *rhus tox.* are remedies of this type; they are frequently indicated upon purely constitutional symptoms, and will accomplish much in this direction.

The *diet* is of importance. Starchy and saccharine foods must be used sparingly, and fresh vegetables, young meats and fowl, milk and fat (cod-liver oil; olive oil; cream, etc.) are to constitute the main dietary. Remembering the strong tendency to anæmia, a highly-nourishing diet becomes imperative.

During acute attacks absolute rest in bed must be enforced, to save the heat and hasten the subsidence of joint-

inflammation. When considerably affected, the joints may be bathed with extract of *hamamelis* and wrapped in raw cotton.

The following are the most frequently indicated and most useful remedies for the various manifestations of rheumatism.

Acon.—Fresh attacks. The early restlessness, fever and involvement of the joints is much benefited by *aconite*, especially when the cause can be directly attributed to chilling of the body.

Apis.—Stinging and burning pains; œdematous swelling of affected parts and synovitis.

Arnica.—Intense soreness of the body; the bed feels too hard; great dread of being touched; scanty, red urine; chilly when moving in bed; great internal heat and sour sweats.

Arsenicum.—Protracted cases. Pale swelling of affected parts; profuse sweats; great anæmia and prostration. Endocarditis and pericarditis (advanced cases; effusion, valvular insufficiency, œdema; cardiac dyspnœa, etc.).

Belladonna is frequently indicated for the febrile condition; general aching; sore throat; torticollis. *Phytolacca* is, however, more frequently indicated in rheumatic sore throat than *belladonna*, and for the torticollis, *lachnanthes* has proven almost specific.

Benzoic acid.—"Rheumatic diathesis in syphilitic or gonorrhœal patients. Urine high-colored; ammoniacal, very offensive in many diseases."—(HERING.) Tearing pains, as if in the bones.

Bryonia is one of the most useful remedies in articular and muscular rheumatism, as well as in the inflammations of the serous membranes complicating the same. In both the latter conditions it is indicated early in the dry stage, as well as after effusion has taken place. *Rhus tox.* is frequently given when *bryonia* is indicated, the mere symptom of restlessness leading to the choice of the former remedy.

If we remember that the *bryonia* patient may become very restless from intense pain—motion, however, giving no relief, and the restlessness being worse before midnight—we will not make the mistake of confusing these remedies.

Calc. carb.—Frequently indicated upon constitutional grounds.

Cimicifuga rac.—“Pronounced cardiac lesions, fibrous nodules, and muscular contractures due to inflammation of the tendons and muscle-sheaths.”—(COBB.)

Chamomilla.—Great irritability of temper; excruciating pains, worse at night; the child tosses about and cannot be pacified.

China.—Often indicated as a tonic.

Dulcamara.—Chronic rheumatism; marked susceptibility to changes of temperature. Also rheumatic cutaneous eruptions.

Ferrum phos.—*Ferrum phos.* and *colchicin* are most effective in controlling the intense pains of acute rheumatism. *Colchicin* I have found more applicable to pains distinctly located along the course of important nerve-trunks, especially the sciatic, while *ferrum phos.* corresponds more distinctly to joint-pains, either localized or shifting about. *Ferrum phos.* is, so to speak, a cross between *aconite* and *bryonia* in rheumatism, its action being as prompt and certain as either of these. It must also be thought of for the *anæmia* which is liable to develop.

Guaiacum.—Rheumatic pharyngitis (*phytolacca* affects the tonsils); rheumatic contractures. Similar to *causticum*, which it is said to antidote.

Hamamelis.—Great soreness of affected parts, especially muscles. The aqueous extract, or the fluid extract highly diluted, has won great popular favor as a local application, superseding such lotions as potassium nitrate and laudanum, lead-water and laudanum, etc.

Mercurius.—Tearing pain, not relieved by sweat; worse at night and from the warmth of the bed; joints usually

swollen, with pale, puffy appearance of the same. General gastric derangement; coated tongue, showing imprints of teeth; foul breath; collection of saliva in mouth with bad taste; diarrhœa. Extension to heart, lungs, pleura and meninges.

Pulsatilla.—Shifting pains, flying from one joint to another. The joints are highly sensitive, but usually no visible signs of inflammation are present. The child is fretful and disposed to cry, frequently changing its position in bed, which gives temporary relief. The symptoms are usually worse at night and aggravated by warmth. Gastric derangements, such as coated tongue, absence of thirst, anorexia, loss of taste or bitter taste, alternate heat and chilliness, and catarrhal affections, are usually present.

Rhus tox.—The pathogenesis of *rhus toxicodendron* clearly indicates that it has a wider range of usefulness in rheumatism than any other remedy. Its selective affinity not only for the joints and fibrous tissues, but its decided action upon the respiratory tract, the nervous system, the circulatory system and the skin, stamp it as the remedy *par excellence* for any affection to which we may see fit to prefix the term “rheumatic,” in the absence of strong, specific indications for other remedies. It is true, the symptoms of *rhus tox*. are not so markedly localized as those of *bryonia*, *phytolacca* or *spigelia*, being most suitable to that class of rheumatic disturbances designated “diffuse, non-circumscribed rheumatism,” but nevertheless it may prove of use in any form, providing its leading indications are present. They are: “Drawing, tearing pains in fibrous tissues, joints, and sheaths of nerves, attended with a sense of lameness and formication in the affected parts; with or without swelling and redness; caused by exposure to wet, damp weather, to rain, by bathing or a strain; WORSE *during rest and when commencing to move*; BETTER *from continued motion and dry, warm, external applications*; great restlessness.”—(C. G. R.)

Sulphur.—Frequently of use as a constitutional or inter-current remedy.

Cactus, *cimicifuga rac.*, *colchicum*, *digitalis* and *spigelia* are indicated in cardiac involvement. (See *Endocarditis*, p. 194).

Syphilis.

In children syphilis is almost invariably an inherited disease, although it may be acquired during parturition from a primary lesion of the vulva or subsequent exposure to infection. Such is usually the case when the mother acquires syphilis late in her pregnancy, for if the disease is acquired after the eighth month the child escapes direct placental infection. The term *hereditary syphilis*, strictly speaking, applies to those cases in which the ovum itself is syphilitic, either from the existence of maternal syphilis or from infection by the semen of the father,—*germinal syphilis*. In such cases syphilis exists from the time of conception. The foetus may acquire syphilis later through placental infection, in which case it is known as *congenital syphilis*, but the distinction is of no clinical importance. *Acquired syphilis* differs from the above forms both in the manner in which the disease gains access into the system and in the presence of the primary sore, or chancre, which is never found in inherited syphilis.

A syphilitic child may be born of an apparently healthy mother through paternal transmission of the disease, and although such a child is a menace to the community from the great degree of contagiousness of the disease, the mother is in no way in danger of infection from her own infant (*Colles' Law*). Likewise, a child may be born of syphilitic parents, having escaped infection, and remain immune to the acquired form of the disease throughout life (*Profeta's Law*).

Symptomatology.—Early or precocious hereditary syphilis may manifest itself *in utero*, leading to a miscarriage. Children showing active signs of syphilis at birth

are seldom born alive. They may appear macerated, or the body be covered with an extensive bullous eruption. The majority of cases do not show signs of syphilis until several weeks after birth, but they almost always appear before the third month. The variety of hereditary syphilis described as *syphilis hereditaria tarda* by Fournier, in which the appearance of specific lesions is supposed to be delayed until after the third year of life, is not recognized by many syphilographers, they being of the opinion that the early manifestations in these cases were overlooked.

The earliest symptoms of hereditary syphilis are macular syphilides on the lower portion of the abdomen and on the buttocks; papules and pustules may co-exist. The pustules are especially common upon the face and buttocks. They have a tendency to ulcerate deeply, forming dark-colored crusts. The skin appears shrivelled, poorly nourished, and presents a brownish discoloration.

Acrid coryza; snuffles; hoarse, plaintive cry; mucous patches in the mouth, rhagades at the angles of the mouth, anal condylomata and gastro-enteric catarrh, inducing foul-smelling diarrhœa, are the prominent symptoms referable to the mucous membranes. The syphilitic child is underdeveloped and highly anæmic; the face wears a characteristic old and anxious expression. The internal organs are the seat of diffuse interstitial hyperplasia of the connective tissue, through which destructive changes are wrought in the liver, lungs, and digestive glandular system. These lesions are responsible for the malnutrition and eventual death of the syphilitic infant, although they frequently die with symptoms of basilar meningitis.

The later manifestations of syphilis, occurring in cases not so malignant from the beginning as described above, are those referable to the bones, teeth, organs of special sense and nervous system. It is readily seen how, in such cases, slight early manifestations can be overlooked or forgotten, and how, upon the development of symptoms

after the third year—even as late as puberty—the true nature of the case is not recognized or suspected.

In the osseous system, *osteochondritis* and *dactylitis* may occur early in the disease. Osteochondritis develops at the epiphyses of the long bones and may lead to deformity. Dactylitis presents a characteristic fusiform swelling of the fingers, attacking, as well, the metacarpal and metatarsal bones. Ulceration often results with the destruction of the bone and integument. Hyperostosis of the tibia, resulting in rounding out of the tibial crest and curving of the shaft—the *sabre-blade deformity*—is very characteristic of hereditary syphilis. In rickets the sharp crest of the tibia remains unchanged, an easy point of distinction. Cranial exostoses upon the frontal and parietal bones are also found in well-developed cases.

The milk teeth are delayed and decay early; the permanent teeth present pathognomonic signs first described by Jonathan Hutchinson, for which reason they are known as *Hutchinson's teeth*. The upper central incisors are dwarfed and present a notch upon their cutting surface, while other teeth show the influence of stomatitis upon their growth.

Two other conditions to which Hutchinson has given much prominence are *interstitial keratitis* and *otorrhœa*. Otorrhœa or sudden deafness should always arouse a suspicion of syphilis. Interstitial keratitis is a frequent symptom of syphilis, developing at the time of puberty.

Nasal deformity is a characteristic sign of hereditary syphilis as well as radiating linear scars at the angles of the mouth. The latter result from ulcerating mucous patches, while the former is due to diffuse gummatous rhinitis, with accompanying ozœna.

Gummatous infiltration of the brain and cord may lead to a variety of disturbances in the nervous system. Cephalalgia; meningitis; epilepsy; dementia paralytica; tabes dorsalis and poliomyelitis anterior have all been traced to syphilis.

As the syphilitic infant presents a characteristic old, withered look, so the older subject of hereditary syphilis may exhibit a diametrically opposite condition, namely, that of "*infantilism*" (FOURNIER). The individual appears younger, both mentally and physically, than his age would indicate.

The *diagnosis* of syphilis is not difficult in the presence of a clear family history and clean-cut consecutive manifestations of the disease, but it frequently presents the greatest difficulty when isolated symptoms are encountered. An underdeveloped, wakeful, old- and unhappy-looking infant (in contradistinction to the bright appearance of the purely marasmatic infant) should always suggest syphilis and lead to a careful watch for such symptoms as snuffles, hoarse cry, offensive diarrhœa, cutaneous eruptions, etc. The later manifestations of syphilis are all characteristic, and in the presence of such symptoms as Hutchinson's teeth; radiating linear scars; flattened nose-bridge; dactylitis and interstitial keratitis, other conditions are readily accounted for.

The *prognosis* of syphilis becomes more and more favorable, the later and the more benign the earliest manifestations of the disease appear. Death from syphilis is quite common in infants, but rare after the sixth month. Probably one-half of syphilitic-born children succumb before the sixth month. The longer life is sustained after that period, with the institution of proper treatment, the greater are the chances for ultimate recovery.

Treatment.—The syphilitic infant is a menace to its surroundings, for, with the exception of its mother, it is capable of infecting anyone with the disease. The lesions in the mouth and the discharges from the nose or from ulcerating papules or pustules anywhere upon the body are the sources from which infection takes place.

If a syphilitic history is obtainable, even before signs of the disease make their appearance, it is advisable to institute treatment at once.

As to remedies, there are quite a number beside *mercury* which are not only frequently indicated, but which are indispensable in the treatment of hereditary syphilis. Usually, however, *mercury* is the best remedy with which to begin the treatment of fresh cases, as it corresponds to the majority of the symptoms of secondary syphilis, the stage in which hereditary syphilis first manifests itself. When rhinitis and laryngitis are the most prominent early symptoms, inducing the so-called "snuffles" and hoarse cry, *kali bichromicum* is the indicated remedy. So, likewise, numerous other remedies may be called for from the beginning on special indications. When using *mercury* I have obtained the best results from the *red iodide*, administering a grain of the third decimal trituration four times daily. As Bartlett* well advises, the administration of *mercury* should be stopped very shortly after the disappearance of symptoms, for there seems to be no necessity for mercurializing the infant. In the late manifestations of hereditary syphilis the *iodide of potash* must frequently be employed in material doses. The smallest dose which will improve the case is the proper one to employ, and I know of authentic cases in which this remedy in potency has yielded prompt, curative results. "It can frequently be well followed or replaced by the *iodide of calcaria* or the *iodide of arsenicum* in lesions of the glands; by *silicea* or *zincum* or *sulphur* in those of the nervous system; and by *hepar sulphuris* or *aurum* or *nitric acid* in those of the osseous system."—(COBB.†)

Asafædita.—Affections of the long bones; severe nocturnal pains; caries of tibia and ankle-joint; ulcers extremely sensitive, discharging thin, offensive pus.

Aurum.—Tertiary manifestations; exostoses on skull, tibia and bones of forearm; dactylitis with ulceration; caries of nasal bones; defective development of genital organs; infantilism; mental depression.

* Goodno, "Practice of Medicine."

† "Present Status of Pediatrics."

Baryta carb..—Glandular enlargements; squamous syphilides.

Fluor. acid..—Tubercular syphilides with ulceration; squamous eruptions; exostoses and nightly bone pains.

Hecla lava..—Destructive ulceration of nasal-bones.

Hepar calc. sulph..—*Hepar* has always been considered a valuable antidote to the evil effects of *mercury*, but aside from this it is a most efficient remedy for many of the purely constitutional manifestations of syphilis. Its well-known influence over suppurative processes renders it useful in pustular skin affections and in the early stages of bone necrosis. The symptoms, "soreness of the nose on pressure, with red, inflamed eyes," hint at beginning caries of the nasal bones, and a similar condition is obtained in the bones of the skull and extremities as well. The sharp, striking pains in the throat are similar to *nitric acid*, but when this remedy is indicated there are other symptoms present by which a differentiation is not difficult.

Kali bichromicum..—Snuffles; harsh voice and hoarse cry; deep ulcers on the edge of the tongue; ulcers on the velum palati, eating through; ulceration of nasal septum (cartilaginous portion); ulcers in general, with characteristic punched-out appearance.

Kali hydroj..—Tertiary syphilis; diffuse and circumscribed gummatous infiltrations; mercurialization; interstitial keratitis; otorrhœa; swelling and ulcerative destruction of uvula.

Kreosotum..—Foul-smelling diarrhœa; the teeth turn black and crumble (*staphisagria*).

Lachesis..—Syphilitic cachexia; ulceration of throat, with painful deglutition and hacking cough; regurgitation of drink through nose; stools very offensive, even when formed.

Mercurius..—As to the homœopathicity of *mercury* to certain stages of syphilis, it is unnecessary to dwell upon it here. An analysis of cases treated with *mercury* indicates

that its most marked effects are the healing of ulcers and improvement in the general health, both of which belong to the truly homœopathic action of the drug.—(HUGHES.)* Its “tonic” action is owing to its hæmatic power, while its control over diffuse inflammation and swelling of the mucous membranes, accompanied by ulceration and inflammations of serous membranes, periosteum and skin, depends upon its specific action upon these structures. This primary, specific action covers almost completely the early manifestations of hereditary syphilis, and the manifestations of *mercurial abuse* cover many of the destructive manifestations of the disease. Impetigo and rupia, rapid ulceration of the mucous membranes, skin and bones, etc., strongly call for *mercury*, especially in combination with *iodine*, as recommended above, or in larger doses when symptoms become urgent.

Mezereum.—Pustular eruptions, forming thick, brownish crusts, with oozing of pus; painful at night; swelling of shafts of bones; syphilitic neuralgia.

Nitric acid.—Deep, irregular ulcers on border of tongue, upon tonsils and soft palate; sticking pains in ulcers; rhagades at angles of mouth; pustular and squamous syphilides; mercurial stomatitis and cachexia; urine strong, ammoniacal; condylomata.

Sulphur.—Syphilitic children often require an occasional dose of *sulphur* to arouse their reactive powers or to control special symptoms. The symptomatology of this remedy is too extensive to be considered here, its sphere of action embracing both general and special indications. *Psorinum* may likewise be called for occasionally.

Thuja.—Flat, condylomatous lesions about the anus and ulcerating papules on the scrotum. In the presence of these indications *thuja* will do more than any other remedy.

* “Pharmacodynamics.”

Marasmus ; Simple Atrophy.

As the term implies, marasmus is a condition of progressive wasting. When seen in its pure form, marasmus presents an extreme degree of malassimilation, resulting in emaciation, atrophy of tissue, arrest of growth, and in many instances death from exhaustion or slight intercurrent ailments. Wasting is a common symptom of intestinal and gastric catarrh, hereditary syphilis and tuberculosis; but cases are repeatedly encountered in which no pathological lesions can be found to account for the marantic state, not even atrophy of the intestinal tubules, an explanation advanced by certain writers, but not substantiated by the investigations of Holt and others. There seems to exist an inherent weakness of constitution and impaired digestive and assimilative power, which, through unhygienic surroundings and unsuitable or insufficient food, gradually assume a state identical with starvation.

Marasmus is, therefore, found most prevalent in the crowded quarters of large cities and in institutions. It is rarely seen among breast-fed babes, although an impoverished mother's milk may lead to its development. Hereditary influence is occasionally traceable; thus, extreme youth of the mother, too frequent childbirth or constitutional disease of the parent may be noted; but it is quite common to find marantic children with perfectly normal parentage.

The *symptoms* of marasmus are those of starvation. They rarely develop shortly after birth, and frequently not until the child has apparently thrived for several months, when a change of food, a slight illness or a derangement of the digestive tract marks the beginning of the trouble. There is progressive wasting, arrest of growth and exhaustion. The extremities become reduced to mere skin and bones, the ribs and vertebræ are prominent, and the belly is usually distended. In the face there is first noticed a wasting of its lower portion, giving the jaw a sharp, triangular

appearance. This, together with the sunken eyes and wrinkled skin, gives the child a characteristic senile appearance; and although the tuberculous subject is much emaciated, there is a brighter expression and less enfeeblement, beside the usual available signs of the disease to differentiate the two conditions.

Anæmia; subnormal temperature; undigested stools; voracious appetite, terminating at times in complete rejection of food as exhaustion advances, and gastric irritability, are the usual accompanying symptoms. General œdema from enfeebled circulation and anæmia; thrush; bed-sores and hypostatic pneumonia are frequent complications.

It is difficult to state the exact *duration* of the disease, as cases may suddenly die from intercurrent ailments, or improvement may suddenly follow upon the choice of a suitable food and remedy; again, cases may continue at a perfect standstill for several weeks. The *prognosis* is the more favorable the later the disease develops, and also in accordance with the possibility for supplying suitable food and surroundings.

Treatment.—A case of marasmus should never be undertaken from the standpoint of an incurable disease, for as long as the child can be kept alive there is hope of finding a food which can be assimilated and a remedy capable of reviving the nutritive forces. It is but too customary to pronounce such a case hopeless after nothing more has been done than to go through the list of proprietary foods, naturally each new trial in this direction failing more signally than the preceding one.

In the case of very young infants who have become marantic from being taken from the breast, a wet-nurse often becomes an absolute necessity to save the child's life. Infants over six months are, however, frequently rescued by careful artificial feeding. These children do best by giving them small quantities of food at frequent intervals until they are capable of digesting a larger quantity given at the

regular interval indicated by their age. A milk formula should be determined upon which will suit the digestive powers of the child; this is usually best attained by beginning with a low percentage of both proteids and fat, and gradually increasing to the point of tolerance. Sugar of milk should be added in relatively large proportions. Instead of using milk exclusively, it is often advantageous to alternate with such foods as albumen-water, panopeptone and meat juice; and in the presence of diarrhœa, barley-water should be used as a diluent in the milk formula. Protonuclein has yielded promising results in many instances, a few grains of the powder being administered in the milk thrice daily. Inunctions of sweet oil and careful massage employed daily are of decided advantage and almost indispensable. In massaging such cases only a mild form of rubbing with one or two fingers should be executed—anything more than this tending to increase the exhaustion. As the temperature is usually subnormal, it is at times advantageous to have the entire body enveloped in a layer of raw cotton.

The following constitutional remedies are the ones most frequently of service:

Calc. carb.—Malnutrition, with distended abdomen; clay-colored, formed, or sour, greenish, loose stools; sweating about the head; cold, damp feet; voracious appetite; crusta lactea and eczema.

Calc. phos.—Scrawny, emaciated children, with flabby abdomen; stools intermixed with greenish mucus; vomiting; lax ligaments; curvature of spine; delayed dentition.

Iodium.—Voracious appetite, with progressive emaciation; dark-complexioned infants; glandular atrophy.

Magnesia carb.—Emaciation; inability to digest milk, which produces pain and is vomited in sour-smelling curds; sour-smelling diarrhœa, with greenish, scum-like mucus; aphthæ.

Mercurius.—Syphilitic taint, vomiting; acrid stools; skin dry and shrivelled, easily becoming chapped and sub-

ject to various forms of eruption; stomatitis; anæmia; offensive sweats. *Merc. cor.* is frequently indicated in such cases in the presence of a characteristic condition of the mouth, the entire buccal cavity and lips presenting a bright-red, raw appearance, as if denuded of their entire epithelial lining.

Natr. mur.—Emaciation most marked about the neck; mapped tongue; great thirst; anæmia and exhaustion; scurfy skin, later developing into oozing eruptions.

Psorinum.—Debilitated infants with an offensive odor of the body; nocturnal diarrhœa; lack of reaction to treatment.

Sulphur.—Emaciated, old, withered-looking infants; cannot bear to be washed; voracious appetite; suppressed cutaneous eruptions.

Beside these are to be mentioned *ars. jod.*, *borax*, *china*, *hepar*, *lyc.*, *phos.*, *sil.*

CHAPTER XVIII.

ACUTE INFECTIOUS DISEASES.

Exanthemata.

THE exanthemata constitute a group of acute infectious fevers belonging to the period of childhood, occurring epidemically, and characterized by the eruption of a typical exanthem upon the surface of the body. To this class belong *measles*, *rubella* and *scarlet fever*. Although a specific causative micro-organism has not yet been satisfactorily demonstrated in any one of them, no doubt exists as to their infectiousness, and it is quite likely, as Welch* states, that they depend upon another form of micro-organism, not a bacterium, for the demonstration and study of which we are at present not fully equipped.

Measles, Rubeola.

Measles is one of the commonest of all diseases of childhood. It occurs preferably in epidemics during those months favoring catarrhal affections; spring epidemics are usually the severest. One attack affords immunity against another. The period of incubation is from ten days to two weeks in the average of cases. Contagiousness is present from the time of invasion, being most pronounced at the height of the catarrhal manifestations and fever. It rapidly vanishes with the disappearance of the eruption, and at the end of the third week there remains little or no danger of contagion. The contagion is usually spread by close contact, and is seldom conveyed by means of intermediate objects or a third person, it also being readily destroyed by thorough airing and fumigation.

* "American Text-Book of Practice."

Symptomatology.—The course of a typical case of measles is in three stages, characteristic to the exanthemata in general, but most clearly defined in measles. They are: the *stadium prodromorum*, or *prodromal stage*; the *stadium eruptionis*, or *stage of eruption*, and the *stadium florescentiæ*, or *stage of desquamation*.

The first stage is characterized by fever and catarrhal symptoms coming on gradually, showing themselves as a cold in the head, with bloodshot eyes and lachrymation, accompanied by chilliness and headache. The cold extends to the larynx and trachea, resulting in the characteristic hoarse cough. On the third day single, lentil-sized red spots are seen upon the roof of the mouth and the soft palate, frequently being observed twenty-four hours before the eruption upon the skin makes its appearance. Koplik's sign is even earlier and more truly pathognomonic of measles in the period of invasion. He describes this buccal exanthema as follows: "If we look into the mouth at this period we see in a strong light the usual redness of the fauces, perhaps not in all cases a few red spots on the soft palate. On the mucous membrane lining the cheeks and lips (buccal mucous membrane) we see a distinct and pathognomonic eruption. This consists of small irregular spots of a bright-red color; in the centre of each spot is the interesting sign to which I wish to call attention. In strong daylight we see a most minute bluish-white speck. These minute bluish-white specks in the centre of a reddish spot are absolutely pathognomonic of beginning measles."* This sign is present in all cases twenty-four hours before the skin eruption, and often three days preceding it.—(KOPLIK.)

The second stage begins on the fourth or fifth day. The eruption makes its appearance first on the face in the

* "N. Y. Med. Record," April 9, 1898. The first article upon this subject appeared in "Archives of Pediatrics," December, 1896.

majority of cases, accompanied by increased fever. Thence it spreads over the entire body surface, the eruption being completed in two to three days. Its spread, however, may be irregular and interrupted, and desquamation may occur on one portion of the body while the eruption is appearing on another. The exanthem is the product of a superficial dermatitis, with papule formation through round-cell infiltration about the papillæ, the cutaneous glands and small blood-vessels. There may also be œdema of the skin accompanying the inflammatory process; this is most prominently seen upon the face. The eruption proper consists of numerous, roundish, lentil-sized red spots, slightly raised above the level of the surrounding skin, or containing in their centre a little papule. Where they are very numerous they coalesce, forming crescentic plaques, or they may fuse entirely into large, spotted areas (*morbilli confluentes*). Cases in which the hyperæmia is so great as to cause cutaneous hæmorrhages are described as *morbilli petechialis* or *black measles*; in these cases the eruption assumes a dark color from petechial hæmorrhages.

A distinctive difference between the eruption of measles and that of scarlet fever is its behavior to point-pressure. "The spots disappear by finger-pressure, but the redness soon reappears from the centre toward the periphery"* in measles, while in scarlet fever the redness reappears from the periphery toward the centre. Dr. Hartmann, however, offered no explanation for this phenomenon, which I think is easily understood from a close study of the eruption. In measles we have papules surrounded by areas of erythema, and by applying firm pressure to a patch of eruption with the finger-point we force the blood from the erythematous area surrounding the papule, but do not completely deplete the hyperæmic papillæ forming the papule, which recovers itself quickly through its great vascularity, for which rea-

* Hartmann, "Die Kinderkrankh.," Leipzig, 1852.

son the redness seems to reappear or even persist in the centre of the compressed skin area. In scarlet fever, on the other hand, we have either a diffuse hyperæmia or a fine, closely-aggregated miliary eruption, which behaves like the erythema surrounding the measles papule; in other words, the area of skin pressed upon is completely depleted, there being no central papule, and the redness reappears from the periphery toward the centre, as the greatest amount of pressure has been brought to bear upon the centre of the area, and consequently the greatest amount of depletion.

In young children convulsions sometimes occur at the time the eruption makes its appearance. The catarrhal symptoms reach their acme, and broncho-pneumonia and troublesome diarrhœa are to be feared during this period. Catarrhal inflammation of the conjunctiva, nose, pharynx, larynx, trachea and bronchi are so closely associated with the course of an attack of measles that they are really to be looked upon as characteristic lesions of the disease. The strong tendency for the process to extend from the bronchi into the bronchioles and air-vesicles is one of the most dangerous features of measles, and almost every fatal case is directly due to pneumonia or exhibits signs of the disease.

The inflammation of the pharynx and larynx may become croupous, and suppurative otitis media appear as a complication at this stage, although neither of these conditions are as common to measles as to scarlet fever.

In the alimentary tract a similar catarrhal condition may become established, showing itself as anorexia, vomiting, heavily-coated tongue with enlarged marginal papillæ, and diarrhœa. The latter, when once established, is liable to continue throughout convalescence.

At the end of about four days the eruption begins to fade out, disappearing first in those localities where it was first seen. In mild cases it has already become much paler at the end of twenty-four hours, and it may disappear en-

tirely from one part while another part is being invaded. With the fading of the rash *desquamation* takes place in the nature of fine, branny scales, first noticed upon the face and neck. It is completed in a week in the average case, seldom continuing for a much longer period.

The eruptive period is prolonged in those cases in which it becomes hæmorrhagic. Here it assumes a deep-red color, gradually becoming darker and remaining until the petechial spots are absorbed. This type is usually indicative of a depraved constitution or a severe form of the disease. Again, the eruption may suddenly disappear, indicating great adynamia and heart failure. The characteristic "measly odor" is most prominent at this time, although it begins to develop during the height of the fever and catarrhal manifestations. The temperature is not high in mild cases, being highest during the eruptive period, when it may reach 103° F. for a short time. In the average case there is an abrupt rise at the point of invasion—about 102.5° F. It soon falls to a lower point, not rising again until the fourth or fifth day, when the eruption makes its appearance. At this stage it may reach 104° F. and higher. In a day or two it drops by crisis, unless it is sustained by a complicating broncho-pneumonia, etc.

Among the many complications liable to arise during the course of measles or appear as sequelæ, the following are the most important and most frequent in occurrence: Broncho-pneumonia (children under three years); lobar pneumonia, pleuro-pneumonia and empyema (three years and over); membranous croup; putrid sore throat; noma; entero-colitis; conjunctivitis and keratitis; otitis media.

The frequency with which tuberculosis develops after measles is noteworthy. In some instances latent scrofulous lesions are stirred up by the attack, while in others it appears that a primary infection occurs directly upon the subacute pneumonic process lingering after convalescence. According to Osler, it is the most important sequela—either

an involvement of the bronchial glands, a miliary tuberculosis, or a tuberculous broncho-pneumonia. Homœopathic authorities are, however, not inclined to take such a grave view in cases of measles under homœopathic treatment, in which sequelæ are rare.

Treatment.—The child should be put to bed in a well-ventilated, moderately-darkened room as soon as the disease is suspected, maintaining a temperature of about 65° F. when possible. It is unnecessary to render the room dark and cheerless, an effectual shielding of the eyes from direct bright light being all-sufficient. The child should be kept in bed until every trace of the rash has disappeared, which usually takes place about five or six days after its first appearance. The removal of the branny scales of epidermis is greatly facilitated by rubbing the child with olive oil, followed by a sponging with tepid water and castile soap. This measure should be employed for several evenings in succession after the febrile symptoms have abated. During the febrile period there is no objection to the cleansing sponge-bath of tepid water. If conjunctivitis be present, the eyes should be washed out several times daily with a 2 per cent. boric-acid solution.

In cases in which the rash is tardy in coming out, or in which there is a recession of the same, a warm bath or pack is of great service. With recession of the rash the condition often becomes grave. When due to cardiac failure stimulation is indicated, and a hot mustard bath is a valuable adjuvant when serious congestion of internal organs (broncho-pneumonia, meningitis, etc.) exists as a complication.

In dieting cases of measles we must bear in mind the tendency to diarrhœal conditions, just as in scarlet fever we must anticipate nephritis.

During convalescence the diet should be highly nutritious, consisting largely of milk, eggs, fresh vegetables, lamb-chops and the like; and if a tendency to tuberculosis

exists, cod-liver oil may be added with advantage. A week should elapse before the child is permitted to leave the house, and by the end of the third week from the commencement of the disease he may be allowed to commingle with other children, as the infectious period has passed by that time.

The following remedies will be found to cover the usual cases :

Aconite corresponds to all of the early symptoms of the usual cases of measles, and when given in time will so control the disease that it frequently becomes unnecessary to give any other remedy during its entire course. It is hardly necessary here to repeat its indications.

Apis.—Confluent eruption, with pronounced œdema of the skin ; œdematous swelling of the throat ; cerebral complications.

Arsenicum is indicated in those adynamic cases in which there is pronounced prostration ; scanty rash ; anxiety and restlessness ; pneumonia.

Cuprum aceticum is preferable when the rash disappears entirely with the advent of cerebral symptoms.

Bryonia.—Cases calling for *bryonia* are characterized by a predominance of catarrhal symptoms right from the beginning, with tendency to extend to the finer bronchial tubes and involve the pulmonary parenchyma. The rash is slow in coming out, but, when once established, it is usually abundant and characteristic. The accompanying symptoms are dry, painful cough ; great lassitude and irritability ; anorexia, with thirst for large quantities of water ; constipation, etc. *Bryonia* is looked upon somewhat as a specific to bring out the rash, but any well-selected remedy will accomplish the same result, notably *pulsatilla*, *kali bichrom.* and *gelsemium*.

Camphora.—"In those dangerous cases where the face grows pale and the skin cold, assuming a bluish, purple color, with utter prostration and spasmodic stiffness of the body."—(C. G. R.)

Coffea is a valuable remedy for the short, dry, teasing cough of measles, frequently becoming a most distressing complaint in nervous, delicate children.

Euphrasia.—Profuse corroding discharge from the eyes, with profuse bland nasal discharge (*allium cepa* has the opposite condition).

Gelsemium.—"After *aconite*, great deal of coryza; drowsy, with fever heat; no thirst. When the eruption turns livid, with cerebral symptoms."—(C. G. R.)

Kali bichromicum is indicated in measles when there is a deep, loud cough, with expectoration of stringy, yellowish mucus; intense conjunctivitis, going on to keratitis and ulceration; stitches in the left ear, extending into the head and neck; watery diarrhœa, with tenesmus; ulcerated sore throat. Even when the symptoms are not as severe or characteristic as above stated, this remedy is frequently of great value, especially when *bryonia* does not seem to act as promptly as it should. It is followed well by *pulsatilla*.

Lachesis.—Livid eruption, countenance almost black, tongue coated dark brown, sordes on the teeth, inability to protrude tongue.—(J. F. MILLER.)

Mercurius is indicated where gastro-intestinal symptoms predominate. The tongue is heavily coated, showing the imprints of the teeth; breath very offensive; diarrhœa of slimy stools, with tenesmus. Also bronchitis, with loose, barking cough and no expectoration; offensive sweats; diphtheritic angina.

Pulsatilla may be indicated early, although its sphere of usefulness lies mostly in the clearing up of the cough and catarrhal symptoms lingering after measles. It is followed well by *hepar*.

Veratrum viride.—"During febrile stage, especially if pulmonary congestion is impending; red streak down centre of tongue; convulsions before eruption."—(C. G. R.)

Other remedies which may be called for upon special indications are:

Bell.—May be indicated early, but less frequently than *aconite* in mild cases. Nervous symptoms predominate, and convulsions are likely to occur at the eruptive stage.

Carbo veg.—Persistent hoarseness remaining after measles.

Drosera.—Cough, occurring in paroxysms in the afternoon, spasmodic, and attended with bloody or purulent expectoration.

Hepar and *spongia* may be required when the cough becomes croupy.

Phosphorus and *antimon. tart.* in those cases in which broncho-pneumonia predominates.

Sulphur.—Either during the first stage when the eruption is tardy, or for the sequelæ, such as chronic coughs, originating in the remnants of partial pneumonia; chronic diarrhœa; hardness of hearing and chronic ear discharges.—(C. G. R.)

Scarlet Fever.

Scarlet fever is a highly contagious, acute, infectious disease of childhood, characterized by fever, angina, and a diffuse scarlet eruption, followed by desquamation. It is endemic in all large cities, often breaking out in epidemics. The greatest degree of susceptibility exists between the ages of two and six; infants usually escape, especially those nursing at the breast, while in children nearing puberty the susceptibility gradually decreases. One attack gives immunity to a second, as a rule. Epidemics are most prevalent during the fall and winter months.

While scarlet fever is not as infectious as measles, its spread being slower and less extensive than that of measles in communities or non-isolated quarters harboring cases, yet its *contagium vivum* possesses much greater tenacity to life, and is much more readily carried from one location to another by means of a third person or by intermediate objects. It retains its vitality for months, and requires active germicidal measures for the successful disinfection of all contaminated articles and localities.

The period of contagiousness is about six weeks, beginning with the invasion of the disease, reaching its height during the febrile period and persisting until desquamation is complete. The source of infection lies in the catarrhal discharges, the scales of epidermis, and probably also in the excreta. The contagion may persist in the expectoration or nasal secretion even after the stage of desquamation.

The exact nature of the causative agent of scarlet fever still remains obscure, although the investigations of Edington, confirmed by Shakespeare, are perhaps the nearest solution to the problem. According to these investigators the *bacillus scarlatinae*, a rapidly-growing organism, capable of producing fever, angina and erythema, followed by desquamation, when inoculated into lower animals (guinea-pigs and calves), is to be considered the specific micro-organism. The period of incubation is short, usually less than a week, and in many cases only one to two days.

Symptomatology.—The course of a typical case of scarlet fever may be divided into the *stage of invasion*, *stage of eruption*, and *stage of desquamation*. Prodromata are rare, the invasion being abrupt, with repeated chills, followed by high fever, headache, prostration and vomiting, together with sore throat. Such a combination of symptoms occurring in a child should always lead one to suspect scarlet fever. The temperature may rise very rapidly to a high point, reaching 104° F. and over; in mild cases, however, it may rise but inconsiderably. The pulse likewise is affected in characteristic manner, attaining a rapidity of one hundred and twenty to one hundred and forty beats per minute quite early in the attack. The throat is highly inflamed, a diffuse erythematous blush covering the tonsils, pharynx, and soft palate. Later on, diphtheritic patches are quite liable to appear.

Within from twelve to thirty-six hours from the beginning of the fever the *eruption* makes its appearance, first showing about the neck and chest, whence it rapidly spreads

over the entire body, this being accomplished within twenty-four to thirty-six hours, or in even a shorter period of time. The eruption appears most intense on the neck, over the extensor muscles, about joints, and on the dorsum of the hands and feet. A peculiar pallor about the mouth is frequently seen, in striking contrast with the rest of the face, producing the characteristic "white line" of the disease. The eruption is due to intense hyperæmia of the skin, accompanied by exudation of round cells into the rete malpighii and serous exudation, the process ending in death of the epidermis, with desquamation of variously sized scales and flakes. When typical, it consists of numerous, closely-aggregated red points, the size of a pin-head, evenly distributed over the entire body, giving it a bright, scarlet color. The eruptive points may be but slightly red in the beginning, later assuming the bright scarlet hue. Usually they are so closely aggregated that they give the skin an appearance of diffuse redness. The points may be flat or elevated, round or lentil-shaped, and with increasing hyperæmia they become confluent, the skin becoming turgescient and tense. The swelling is most marked about the face and eyes in these cases (*scarlatina lævigata*). This is the variety for which Hahnemann recommended *belladonna* as both prophylactic and curative, while for *scarlatina miliaris*, a variety in which there are papules interspersed with fine vesicles filled with a turbid serum, he recommended *aconite*,* considering it a special variety of scarlet fever. Another deviation from the usual eruption is the appearance of roseola-spots of various sizes and shapes, separated by pale areas of skin (*scarlatina variegata*). In some cases the rash is but partial, often being absent from the face in mild cases. It may be extremely faint in color, or assume a deep purplish hue, or become hæmorrhagic.

At the height of the eruption the skin is burning hot to

* Hartmann, "Kinderkrankheiten."

the touch, and the patient complains of burning, stinging and itching; at this time, also, all symptoms are most intense.

Pressure with the finger causes momentary disappearance of the rash, which reappears from the periphery toward the centre, differing in this respect from the rash of measles.

The *tongue* is thickly coated white; the edges, however, remaining red. In the course of a few days the coating is shed, leaving the red and swollen papillæ exposed, with the resulting characteristic appearance described as “strawberry-tongue.”

Should the *throat* become seriously affected at this time, patches of membrane will be seen upon the tonsils which may spread to the soft palate and adjacent parts. This complication is usually due to streptococci, true diphtheria being rare during the course of scarlet fever, and, when associated with the same, occurring as a sequela rather than a complication.

Otitis is a frequent complication occurring at this time, the result of an extension of infection from the angina. It usually terminates in suppuration, and is one of the commonest causes of deafness in children. When occurring during convalescence it is more readily recognized, as there is recurrence of fever, with distinct earache and impairment of hearing.

Parotitis and *cellulitis of the neck* sometimes accompany the septic process in the throat. The termination of such a process is usually in suppuration. Likewise the tonsils and lymphatic glands of the neck may share in the suppurating process, rendering the prognosis most unfavorable.

Synovitis of the larger joints is prevalent during some epidemics. It develops between the first and second weeks. The duration is short, never ending in suppuration. Beside this condition, an attack of *acute articular rheumatism* is frequently invited in individuals of the rheumatic diathesis,

occurring as a complication of the scarlet fever either during the eruptive stage or during convalescence.

Post-scarlatinal nephritis is one of the most constant and most important complications of scarlet fever, occurring typically during the third week. Pathologically, it is an acute, diffuse, productive nephritis. (See *Acute Nephritis*, p. 211 [under "Etiology."]) It is a more serious condition than the simple acute degeneration or acute exudative nephritis which may occur early in the course of the fever, just as in any other acute infectious disease. There is scanty urine and general dropsy, and suppression of urine and acute *uræmia* may supervene. Although the kidney is much damaged, the child shows a fair chance of "growing out" of the disease, so to speak, under careful treatment.

Desquamation begins shortly after the rash has faded, about the end of the first week. It begins in the localities in which the rash first appeared, showing itself as scales of varying size about the neck and chest. Gradually the entire trunk is involved in the process, desquamation being completed here long before the fingers and toes have shed their dead epidermis. In these parts, especially where the skin is thick, the peeling process is slow, and large pieces of skin, sometimes complete casts of the fingers, are detached in the "moulding" process.

The *prognosis* depends to a great extent upon the character of the epidemic; the general health of the child before the attack; the height of the fever, and the severity of the attending complications. As a rule, the disease is more liable to prove fatal if the child is very young, especially when serious throat implication, nasal diphtheria, diarrhœa or otitis are associated.

Among the later dangers are especially to be feared nephritis, which displays a tendency to develop particularly in cases in which cutaneous manifestations are mild, probably because the scarlatinal toxins are more actively excreted through the kidneys than through the skin in these

instances. Should uræmic convulsions supervene, either death or cerebral hæmorrhage with resulting hemiplegia, etc., may result. Otitis always carries with it the danger of cerebral abscess. The patient is also liable to develop true diphtheria at this time.

Convalescence is usually protracted owing to anæmia; chronic otorrhœa and nasal catarrh; hypertrophied tonsils; post-scarlatinal nephritis.

Diagnosis.—Scarlet fever differs from *measles* in the abruptness of its onset, the absence of Koplik's sign and prominent catarrhal symptoms, and the characteristic appearance and behavior of the eruption alluded to in the symptomatology of both affections. From *rubella* it is also distinguished by the absence of catarrhal symptoms, by the characteristic appearance of the tongue, and by the occurrence of desquamation. *Symptomatic rashes* can usually be traced to the partaking of certain articles of food or the administration of certain medicines, or to teething. The rash is of short duration, sore throat is absent, and in the absence of gastric derangement the temperature is normal. Many of the infectious fevers are at times accompanied by an erythematous rash, causing considerable confusion as to the true nature of the case. Any doubtful case, however, after which desquamation and nephritis may occur, cannot be considered and accepted as anything but scarlet fever.

Treatment.—With the occurrence of suspicious symptoms the patient should be immediately isolated. From that time on, until desquamation is completed, and, if practicable, until all pronounced catarrhal discharges have been controlled, the child should be kept away from all others to whom or through whom it may convey the contagion. Six weeks from the beginning of the attack is usually a sufficiently long period of quarantine; but, just as with the classical ten days of the lying-in period, there is liability to variation in either direction.

The bedroom should be freely ventilated, and all unnec

essary articles of furniture and hangings should be removed, but not after they have been exposed to the contagion, unless they can immediately be disinfected. A sheet wrung out of a 2 per cent. solution of carbolic acid and hung in front of the door adds to the completeness of isolation. All kitchen utensils, etc., used by the patient should be immersed in a 4 per cent. solution of carbolic acid or formaldehyde for an hour before being removed from the room. They should then be scalded, or, still better, boiled for a quarter of an hour. All sheets, rags, articles of clothing and furniture that can be dispensed with are best burned. For disinfection of the room after its vacation by the patient there is nothing equal to formaldehyde gas generated in the Schering lamp from pastilles. If sulphur be used, one pound must be burned for each 100 cubic feet of room space; at the same time steam should be generated, the room of course being hermetically sealed during the operation. It is always wise to precede the fumigation by a thorough mopping of the floors with a 1 to 2000 bichloride solution, allowing it to dry there. If the walls are papered, they should be rubbed down with slices of rye bread or repapered.

During the occupation of the room by the patient the spraying of hydrogen dioxide with an atomizer greatly aids in keeping the air pure. If the patient suffer much from angina or laryngitis it will prove advantageous to generate steam, at the same time placing dishes of slacked lime about the room.

“The terrible burning and itching of the skin is best relieved by rubbing the body all over with bacon, olive oil or cocoa-butter, once or twice a day; always if the skin is dry, glands swollen, and there is a scrofulous diathesis.” I would object to the use of carbolized oil or other powerful antiseptic applications to the skin at this time, its action being necessarily injurious and its efficacy in destroying contagion questionable.

In case of high fever a sponge-bath of tepid water and alcohol (one part of alcohol to three of water) is of great service. In the advent of anasarca or suppression of urine a warm pack should be used. (See Treatment of *Acute Nephritis*, p. 210.) For the throat, a spray of alcohol one part, glycerin one part and water four parts, is to be used several times daily to alleviate as far as possible the catarrhal symptoms. Likewise, the nose should be kept scrupulously clean by means of a normal saline solution or a 2 per cent. bicarbonate of soda solution. These simple measures may prevent ulceration and suppuration in the throat, and also suppurating otitis media. Pseudo-diphtheria developing, it should be treated with *permanganate of potash*, as recommended under *Diphtheria*.

“As a preventive I would still recommend the potentized *belladonna*, one dose every night, until symptoms appear. If it cannot prevent the attack, it has seemed at least to mitigate its violence.”—(C. G. R.)

The *diet* should be restricted to a non-nitrogenous one as far as possible, in order to relieve the kidneys of any extra strain in its excretory work. Solid food, especially meat, should be prohibited until after the third week, and in case of nephritis developing, a milk diet must be carried out for a still longer period.

The remedies of first importance in scarlet fever are the following:

Aconite.—*Scarlatina miliaris*. High fever; great restlessness and anxiety; whining and moaning; delirium, with irrational talking; anorexia; mouth and throat dry; pharynx and tonsils deep-red color; skin hot and dry. It is usually followed by *rhus tox*. The eruption in these cases does not correspond to the diffuse, smooth redness characteristic of *belladonna*, and, with full development of constitutional symptoms, the condition goes over into a typical *rhus* state.

Arsenicum.—Eruption tardy, scanty, or becoming petechial. Adynamic cases, with putrid sore throat; nephritis;

dropsy; typhoid state. The usual characteristics of the remedy are present.

Belladonna.—" *Belladonna* is only indicated in the smooth form of eruption with vascular and nervous excitement; it does no good in adynamic cases. The miliary form of eruption is much more adapted to *amm. carb.*, *lach.* or *rhus tox.*"—(C. G. R.) There is congestion of the brain, with active delirium; sudden starting in sleep; bright, glistening eyes; throbbing of the carotids; cerebral congestion; tongue coated white, with red edges, the papillæ showing through the coating; bright redness of throat, with swelling and dysphagia; pungent heat of skin, with moisture on covered parts.

Bryonia.—Delayed appearance of eruption; face crimson red; mouth and lips dry; tongue dry and brown; great thirst; the child wishes to lie perfectly quiet and undisturbed. *Bryonia* is frequently indicated when rheumatism, synovitis or involvement of the pleura and meninges complicate the case.

Cuprum.—Sudden recession of the eruption, with occurrence of cerebral symptoms. The *acetate of copper* is usually preferred. The *arsenate of copper* should always be thought of when the condition is one of uræmia.

Gelsemium.—In the early stages, when there is the characteristic dullness and drowsiness; aching and prostration; soft, compressible pulse; aching in the eyes and back of head. The throat is red and feels swollen; the eyes are suffused, and the patient feels chilly, especially along the spine.

Lachesis.—Scarlatina miliaris. Eruption becoming purple and livid; desquamation delayed; urine blackish; oppression when lying down; diphtheritic complication; diarrhœa, with foul-smelling stools.

Rhus tox. may be indicated from the beginning when the rash is not of the smooth, diffuse variety, and, instead of vascular and nervous excitement, there is prostration, with

great bodily restlessness; high temperature, with drowsiness; tongue red and smooth; epistaxis; œdematous swelling of the skin in various parts, the eruption becoming dusky with the development of miliary vesicles; swelling of the parotid gland and cellular tissue about the neck; ulceration of the throat.

Sulphur.—Intense redness of entire body, like a boiled lobster; skin hot and dry, with great burning.

Veratr. vir.—In the beginning, when there is great vascular excitement; wiry pulse; dilated pupils; convulsions. The pulse is hard and wiry, arterial tension being greater than in *aconite*, while anxiety and restlessness are less marked.

Zincum is indicated where the eruption is scanty, of a pale bluish-red or entirely absent, while cerebral symptoms are pronounced. “Especially in the anæmic; brain exhausted; not able to develop exanthemata.”—(HERING.) Meningitis in the stage of paralysis. Convulsions, followed by stupor; the feet are in constant motion, or the child lies perfectly motionless, with eyes open, pupils dilated, cornea insensitive. When these symptoms are present, there is little to be hoped from any remedy; but if we can anticipate them, and give *zincum* on its constitutional indications, a fatal termination is often averted.

Remedies less frequently indicated, but of great importance in special cases, are:

Ailanthus.—Miliary rash; small, rapid pulse; the eruption becomes dark and livid; intense angina, with acrid discharge; muttering delirium, followed by stupor.

Arum triph.—Tongue red and swollen; acrid discharge from nose; diphtheria; swelling of submaxillary glands; the corners of the mouth and the lips are cracked, and the child picks at the lips and finger-nails until they bleed.

Ammon. carb., *apis*, *calc. c.*, *carbolic acid*, *lycop.*, *muriatic acid*, *opium*, *phosph.*, *phos. ac.*, *phytolacca* and *stramonium* also bear a strong relationship to special cases.

Complications and Sequelæ.—*Throat complications* call for *phytolacca*, the various salts of *mercury*, *kali bichrom.*, *permanganate of potash*, *lachesis* and others. (See *Diphtheria*.)

Cellulitis and parotitis.—The most important remedy for this complication is *rhus tox.* Suppuration may call for *hepar*, *mercurius*, *lachesis*, *silicea*.

Otitis.—*Bell.*, *puls.*, *rhus tox.*, *plantago*. Cerebral complications.—*Apis*, *bell.*, *helleb.*, *hyos.*, *stram.*, *sulph.* and *zinc*.

Entero-colitis.—*Mercurius* usually controls the diarrhœa, but *sulph.*, *rhus tox.*, *veratr. alb.*, *lach.* and others may likewise prove of use.

Nephritis.—*Cantharis* is a most valuable remedy in post-scarlatinal nephritis when there is not much blood in the urine and only moderate dropsy. When the latter is pronounced, *apis* and *arsenicum* are of greater service. The characteristic “smoky” appearance of the urine frequently seen after scarlet fever, from the free admixture of blood, is a strong indication for *terebinthina*.

Rubella.

Rubella, *Rötheln*, or *German Measles*, is characterized by moderate fever, sore throat, and an exanthem which in some instances resembles that of measles (*rubella morbilliforme*), and in others that of scarlet fever (*rubella scarlatini-forme*). Complications or sequelæ are scarcely ever observed. It usually occurs epidemically, and one attack gives immunity against another, but in nowise protects against measles or scarlet fever.

Nothing definite is known of its *etiology*. It is contagious, but less so than measles or scarlet fever; nevertheless it may be spread by articles of clothing, etc. Infants under six months are immune. The incubation period averages two weeks, but varies greatly in either direction.

Symptomatology.—The period of invasion is short, prodromata usually being absent. Drowsiness, slight fever

and sore throat precede the eruption by a day or more in some cases; in others the rash appears before the child has made any definite complaints, or has been observed to be sick. It is first seen upon the face, from which it spreads over the entire body in the course of twenty-four hours. Although the face is the most constant site for the eruption, even when the rash is developed but partially, the chest and back may show the first signs of eruption in exceptional cases. The duration is about three days. Often it has completely faded from the face by the time the lower extremities are involved.

In *rubella morbilliforme* there are seen a discrete, maculopapular rash of pale-red color, the eruptive points being slightly elevated, and about the size of a pin's head or larger. These lesions have a tendency to become confluent upon the face, particularly so when they are numerous.

In *rubella scarlatiniforme* the rash is of a diffuse, uniform scarlet color, never as intense, however, as in scarlet fever, and with unmistakable evidence of the maculopapular eruptive points in various localities (on the forehead, fingers and toes, and about the wrists).

Desquamation occurs to a slight degree after deflorescence of the rash, but in mild cases it may be entirely wanting.

Catarrhal symptoms are not a necessary accompaniment of rubella, and throat symptoms may be so slight as to remain unnoticed. The superficial lymphatic glands of the posterior cervical and posterior auricular region are transiently swollen, this being one of the characteristic symptoms of the disease.

The duration is short, seldom over five days. The *prognosis* is good; complications are rather to be considered accidental than otherwise.

In many instances the *diagnosis* can only be made after the mild course of the disease has been observed, together with the absence of complications and sequelæ, especially if

an epidemic is not known to be active at the time. When, however, we are aware of such an epidemic, and especially if the child have previously had one of the other exanthemata, the diagnosis presents little or no difficulty.

The *treatment* is simple in an authentic case of rubella, but until we are aware of the true nature of the case, the child should be cared for identically as in a case of measles or scarlet fever, in order not to expose it to the possibility of complications or sequelæ through any mistake of ours. Cases resembling measles will require remedies suited to mild cases of the same (*aconite*, *bryonia* or *pulsatilla*), and those resembling scarlatina will usually require nothing more than a few doses of *belladonna*.

Variola ; Varioloid.

Variola, or *smallpox*, is an acute infectious, highly contagious disease, characterized by fever of a typical course; vomiting; intense lumbar pains, and an eruption of papules passing through the stages of vesicles, pustules and crust formation, the vesicles being umbilicated.

The nature of the *contagium* has not been determined. It is contained in the secretions, excretions and exhalations of the body, being especially disseminated by means of the dried scales and contents of the pustule.

It attacks all ages, from the fœtus *in utero* to the aged. Among children it proves especially fatal. One attack protects against another, for at least a long period of time. The period of incubation is from nine days to two weeks.

The pock consists first of an area of round-cell infiltration into the *rete mucosum*, in which a central area of coagulation necrosis takes place. Inflammatory reaction occurs around this area, which represents the central depression of the vesicle, with the formation of a reticulated vesicle containing serum, leucocytes and fibrin filaments. Pustule formation supervenes, the leucocytes and cells of the *rete mucosum* becoming necrotic.

Symptomatology.—The invasion is marked by a severe chill or repeated chills, in children, often convulsions, with rapidly rising temperature. Vomiting and intense back-ache are accompanying symptoms. “In some epidemics the initial stage is marked by an erythematous eruption, either diffuse or measly, or by a hæmorrhagic exanthem which consists of extremely small punctate, often pin-head sized hæmorrhages into the epidermis, at times so closely crowded together that the impression of a diffuse redness is produced.” The temperature rises on the first day to 103° to 104° F., continuing with slight morning remissions until the evening of the third day, when it reaches its highest point. On the fourth day it falls several degrees, this remission lasting until the seventh or eighth day, when there is a secondary rise—the suppurative fever.

The stage of eruption commences on the evening of the third day. “There appear little red spots first in the face. If very numerous they coalesce, like measles-spots, with which they might be confounded if it were not for the granulated feel which they present to the sense of touch (like shot).”

The eruption rapidly spreads to other portions of the body, and on the third day of eruption the papule is converted into a clear vesicle presenting an umbilication at its summit. The vesicle is also loculated. In the course of a few days (eighth day of the disease) the vesicle has been transformed into a pustule, which dries up after a few days longer or breaks down, with the formation of soft, yellow crusts, later becoming brownish and dropping off, leaving a somewhat elevated spot which in time entirely disappears. This occurs where the lesions are discrete and where the process has not extended into the deeper layers of the skin. Here they adhere for a long time, leaving an uneven scar, which at first looks white, but by degrees grows conspicuously white, to remain so throughout life.

Simultaneously with the appearance of the eruption upon

the skin, the identical lesions develop upon the mucous membranes exposed to the external air. Here it may result in great destruction of tissue.

Smallpox may run its course as a discrete, confluent, hæmorrhagic, gangrenous or malignant variety. The modified variety occurring in those partially protected by vaccination, and running a mild course without secondary fever, is described as *varioloid*. In every other respect it is identical with true smallpox.

The *prognosis*, excepting in varioloid, is always grave. As complications may be mentioned broncho-pneumonia, pleurisy, septicæmia, ulcerating keratitis, suppurating otitis, arthritis.

The *diagnosis* is often rendered difficult by the primary erythematous eruption. The true eruption may be confounded with *measles* in its early stages, but the sensation of balls of shot under the skin imparted to the finger by the papules of smallpox is a pathognomonic distinction, beside the severe initial symptoms of the attack.

From *varicella* it is distinguished by the intense symptoms. The later appearance of the eruption, which does not develop in crops as in varicella, is distinctly umbilicated, and presents a distinct inflammatory areola.

Treatment.—As smallpox is one of the most serious and most dreaded of all contagious diseases, every precaution to prevent a spread of the same must at once be instituted in all suspicious cases. The most rigid isolation and disinfection, as described under *Scarlet Fever* (p. 390), must be carried out to the letter. Beside this, every person in the house not recently successfully vaccinated should immediately undergo the operation. The patient must have as much fresh air as possible. If fever is very high, sponge-baths are indicated. Osler* has come to the conclusion that the preventing of pitting is really not in the hands of

* "Practice of Medicine."

the physician. Protecting the ripening papules from light and keeping the hands and face covered with lint soaked in cold water or mild antiseptic lotions are, however, to be recommended. Later on, it is advantageous to prevent the crusts from becoming hard and dry by the free application of vaseline.

In the early stages, *aconite*, *bell.*, *bry.*, *gelsemium* and *rhus tox.* are recommended. Jahr* began all cases with *variolinum* as soon as a diagnosis could be established; and if, in spite of this remedy, the course became a grave one, he followed with *sulphur*. He preferred these two remedies above all others.

Vaccininum is spoken of favorably by Goodno and others.

Malandrinum has been likewise used both for curative and preventive purposes, and is held in high esteem by some.

Tartar emetic is perhaps the most homœopathic of the thoroughly proven drugs to variola, and it is of great clinical value in the disease. For the symptomatology of these and other remedies used by those who have had extensive experience in the disease I must refer to the standard homœopathic literature upon the subject.

Vaccinia.

Vaccinia, or *Cowpox*, is an eruptive disease of the cow, inoculable into man, and producing a lesion at the site of inoculation resembling the pock of variola, together with constitutional disturbances. A successful inoculation with vaccinia affords protection against smallpox in the majority of cases, at least for a number of years. Smallpox breaking out among those who have been vaccinated usually assumes a mild course, *i.e.*, varioloid. As to the modifying influence of vaccinia upon smallpox, there is a difference of opinion. According to Marson, if a person exposed to smallpox be vaccinated within four days, small-

* "Therapeutische Leitfaden."

pox will be prevented; if later, but early enough to allow the vessels to reach the stage of areola, the attack of smallpox will be modified, but later than this it is useless. Curschmann opposes this view as erroneous. It is interesting to know the views expressed by Hahnemann on this subject, which are no doubt borne out by the most trustworthy clinical testimony—"It is well known that when variola is added to cowpox, the former, by virtue of its superior intensity as well as its great similitude, will at once extinguish the latter homœopathically, and arrest its development. Cowpox, on the other hand, having nearly attained its period of perfection, will, by its similitude, lessen to a great degree the virulence and danger of a subsequent eruption of smallpox, for which we have the testimony of Mühry and many others."*

The operation of vaccination consists in the introduction of the lymph of heifers into the system by bringing it in contact with a scarified surface for a sufficient length of time to permit of its absorption. Having cleansed the site of inoculation (the usual seat is the left arm, just below the insertion of the deltoid muscle) with soap and water, followed by alcohol or ether, a few parallel scratches about a quarter of an inch in length are made with an aseptic needle, just deep enough to break the epidermis and expose the *retamucosum*. A drop of *glycerinated vaccine lymph*, this being the most reliable and aseptic form in which the virus can be obtained, is placed upon the scarified surface and rubbed in gently with the needle. After an exposure of a quarter of an hour the scarification is covered with a piece of sterilized gauze, over which a bandage is applied. By the adoption of this careful method, complications and sequelæ rarely, if ever, follow.

Symptomatology.—During the first three days after the operation, nothing excepting a slight local irritation, soon

* "Organon."

subsiding, will be noticed. On the third day, however, a papule appears at the site of inoculation, surrounded by an areola; this papule is converted into an umbilicated vesicle on the fifth or sixth day. The vesicle attains its maximum development by the eighth day, after which it becomes pustular. The areola gradually increases in size and deepness of color until this time, when, with the drying up of the pustules, it is converted into a scab. On the twenty-first day the scab comes off, leaving the characteristic deep, circular, pitted scar.

The constitutional symptoms accompanying vaccinia are fever, malaise, anorexia, etc., which begin with the eruption, and attain their height at the period of pustulation, after which they rapidly disappear. Swelling of the axillary glands is usually present.

Variations from the above-described course frequently occur. The vesicle may be late in developing; may be premature and not fully developed; a generalized pustular eruption may accompany the primary lesion, which may persist in recurring attacks after healing of the same; or complications, notably erysipelas, ulceration and sloughing, glandular abscesses and septicæmia, may develop, as the result of faulty technique. Beside this, the invaccination of syphilis (when humanized virus was used) has occurred, and claims have been made that tuberculosis was likewise transmitted. This, however, has not been proven, although vaccination undoubtedly has frequently been the exciting cause in lighting up a latent tuberculous lesion in strumous and tuberculous children into an acute condition.

The age at which children are vaccinated is usually the third month, in the absence of any acute or constitutional illness. In the absence of an epidemic of smallpox, I do not see the necessity for so prompt a procedure. It is quite early enough to vaccinate the child after it is out of its teething difficulties, and some physicians, believing in the efficacy of vaccination to control whooping-cough, keep it

in reserve to be employed as the opportunity manifests itself. The child should, however, be vaccinated before it is sent to kindergarten or school, and revaccinated at the period of puberty or on the occurrence of an epidemic of smallpox.

Treatment.—After vaccination I give *aconite*, following the same with *belladonna*, if fever, headache, diffuse redness and swelling about the site of eruption, and glandular swelling develop. *Apis* or *rhus* may be indicated by erysipelatous manifestations. After the acute symptoms have subsided it is well to give a few doses of *sulphur*. I firmly believe that if vaccination be carried out on strictly aseptic lines, and the child be treated throughout as in the case of any other illness—by being put to bed, if necessary, and carefully prescribed for—none of the many complications and so-called constitutional after-effects attributed to vaccination will follow. The complications and sequelæ of improper vaccination, and the constitutional disturbances caused by the same, will require careful symptomatic treatment. Especially recommended are *thuja*, *silicea*, *mel-andrinum* and *sulphur*. Beside these remedies, many others, such as *ars. jod.*, *hepar*, *mercurius*, *lycopodium*, *tuberculinum*, etc., may be indicated as the case requires.

Varicella.

Varicella, or *chicken-pox*, is an acute infectious disease characterized by the eruption of discrete vesicles, which appear in crops, and disappear, in the course of a few days, by desiccation.

The specific virus has not been isolated, but it is known to exist in the vesicles, and can be transmitted by inoculation. The usual manner of contracting the disease is through contact with a case, although a third person may carry the infection. One attack protects against another. It may occur sporadically or epidemically. The period of incubation is usually two weeks.

The *symptoms* are slight in the majority of cases, but they may assume such a grave nature in delicate children, especially in the tuberculous, that the diagnosis may seem doubtful at the time. However, the subsequent course of the disease will remove all confusion in the matter. The onset is abrupt, as a rule, the first signs of the disease being the appearance of papules and vesicles upon the trunk and extremities, accompanied by slight fever, anorexia, coated tongue and languor. Constitutional symptoms may be so slight as to attract no attention. Each day a new crop of vesicles makes its appearance; this usually continues for three or four days.

The eruption appears first as a small red papule, soon becoming vesicular. The vesicle is unilocular, although at times multilocular vesicles are seen. They are surrounded by a faint aureola, and do not become pustular unless infected by scratching, etc. In the course of a few days they dry up, the crusts soon falling off without leaving a scar, although in some cases a circular, pale area is left, which persists for some time, or, if ulceration has taken place, quite a visible scar may remain.

Varicella gangrænosa is that type of varicella which is attended by gangrenous stomatitis, as a result of infection in poorly-nourished or tuberculous children. If the process becomes extensive, it may prove fatal. As complications—which, however, are fortunately rare—may be mentioned erysipelas, adenitis, cellulitis, gangrenous dermatitis and nephritis. It is quite common to have varicella and one of the other infectious fevers occur simultaneously, although the error must not be made of considering those cases of varicella beginning with an erythematous or measles-like rash as cases of varicella plus scarlet fever or measles.

Diagnosis.—Varicella is to be distinguished from *small-pox* by the slight constitutional disturbances accompanying the rash, which appears abruptly, coming out in crops, and

soon disappearing by desiccation, without pustulation or scar-formation. (See *Variola*, p. 402.)

Treatment.—In the presence of fever, rest in bed, a light diet, and, when there is much itching, the use of rye-flour as a dusting-powder, or olive oil and boric acid, is about all that is required in mild cases. *Aconite* may be called for in the beginning, to be followed by *rhus tox.* The gangrenous or pustular variety will call for *arsenicum*, *mercurius*, *rhus tox.*, *lachesis*, etc.

Pertussis.

Pertussis, or *whooping-cough*, is an acute infectious disease attended with a catarrhal process of the respiratory tract and a characteristic paroxysmal cough. It occurs both epidemically and sporadically, infection taking place through close proximity to a case; seldom through the agency of a third person. Close proximity, however, is necessary, as the air does not seem to convey the contagium to any great distance about the patient. Epidemics are said to occur every eighteen months to two years in large cities, as in measles.

Several micro-organisms have been credited with being the true exciting cause. Afanassjew isolated a short bacillus, the *bacillus tussis convulsivæ*, but failed to demonstrate satisfactorily the reproduction of whooping-cough by inoculation with pure cultures of this bacillus. The investigations of Czaplewski point to another bacterium as the *contagium vivum*; this bacterium is two to three times as long as broad, rounded and somewhat thickened at its ends, is divided in the middle, and surrounded by a capsule in its natural state. The secretions of the normal mucous membrane of the nose contains very few bacteria, while in whooping-cough we find a large mass of this particular kind, a natural pure culture.—(WAGNER.*)

* "Early Diagnosis of Whooping-Cough," N. Y. Med. Jour., Oct. 8, 1898.

The *contagium* exists mainly in the sputum, and the patient should be considered capable of spreading infection as long as the cough retains its characteristic paroxysmal nature. The period of incubation is from one to two weeks.

The *pathological processes* accompanying whooping-cough are catarrhal inflammation of the larynx, particularly in the region of the interarytænoid cartilages; tracheitis and more or less bronchitis; rhinitis. In fatal cases bronchopneumonia with emphysema and areas of atelectasis is the most common lesion found; there may also be enterocolitis and cerebral congestion, with effusion and cortical hæmorrhages.

Symptomatology.—The course of whooping-cough is in three stages: the premonitory, or catarrhal; the spasmodic, and the stage of decline. The first stage usually lasts ten days to two weeks; the second stage may persist for a month or more; while the stage of decline is a gradual transition into an ordinary bronchial cough, which varies with the state of the child's health and with the season of the year. The average duration of an ordinary case is, therefore, about six weeks, but the course is greatly influenced by treatment and by the advent of complications.

The attack begins as an ordinary cold, indistinguishable in the beginning from a simple bronchitis, with, however, this difference, that instead of yielding to treatment in the course of a few days, or abating of its own accord, the cough gradually increases in frequency and severity, soon assuming the paroxysmal and spasmodic type characteristic of the disease.

Examination of the chest at this time reveals nothing beyond a slight bronchitis. In the very beginning there is usually indisposition, running from the nose, a short, dry cough, and slight fever. These symptoms soon abate, but the cough increases in severity. The cough is characterized by a sudden, loud expulsive effort, followed in rapid

succession by similar efforts of gradually decreasing force ; through these continued explosions the chest is almost completely emptied of air, so that the child is obliged to draw in a deep breath at the end of the paroxysm. As the glottis is narrowed during this long-drawn inspiration, a loud, piping sound is produced, constituting the whoop, after which the disease is named. As soon as the lungs have been refilled the cough begins anew, consisting, as before, of rapidly following expulsive efforts, ending with the whoop. This continues (two to six successive efforts) until the paroxysm is terminated either by the dislodgment of a plug of mucus from the trachea, or by the vomiting of the ingesta or a large quantity of tenacious mucus.

During such an attack the face becomes red, even livid ; the eyes are injected and bulging, and the child clings to the nearest object for support, or stands with the feet wide apart and the hands resting upon the knees. Bleeding from the nose frequently occurs during the paroxysm, and cortical hæmorrhages from the meningeal vessels are to be feared in violent cases. When such a hæmorrhage is extensive, hemiplegia and convulsions will follow.

The number of paroxysms in a day will vary from only a few to as many as fifty. They are usually more frequent during the night. In very young children the cough is not as characteristic as in older ones, the whoop being especially faint or indistinct, but the same paroxysmal nature of the cough is present, and, indeed, they may suffocate during a severe spell.

There are signs upon which we can base a fairly positive opinion as to the existence of whooping-cough in most cases, even without having heard the cough. But it is rarely necessary to exclude this pathognomonic symptom, for should the child evince no desire to cough during our examination it is but necessary to press the finger into the jugular fossa, or irritate the pharynx with a tongue depressor, to bring on a paroxysm. The face appears bloated

from the recurring vascular enlargement, and the eyes are deeply injected; at times slight hæmorrhages are seen upon the conjunctiva. The eyes are unnaturally moist. Under the tongue a characteristic sign is frequently seen, namely, ulceration of the frænum. This is induced by the repeated propulsion of the tongue over the lower incisor teeth in coughing. In my experience it has only been present when there was a catarrhal stomatitis in association with the whooping-cough, rendering the mucous membrane particularly vulnerable.

With the decline of the disease the paroxysms become less frequent and less severe, soon losing the spasmodic character of the cough, and the expectoration becomes muco-purulent, as in an ordinary bronchitis. With a fresh cold the whoop may reappear; this, however, is to be considered rather as an intensification of the cough in a subject in whom the spasmodic habit has been formed than as a true recurrence of the disease.

The commonest complications of whooping-cough are broncho-pneumonia (in the winter months) and entero-colitis (summer months). The advent of broncho-pneumonia is recognized by the appearance of fever, together with rapid respirations and dyspnœa, and subcrepitant râles throughout the chest. The cough may change during the height of such a complication, assuming more the incessant, dry or rattling character belonging to broncho-pneumonia.

Diarrhœa is liable to become a troublesome symptom in delicate children, often leading to marasmus.

Convulsions due to extreme general nervous irritability are frequent among infants. They may, however, be due to asphyxia, meningeal hæmorrhage, or pneumonia, giving the case an entirely different aspect.

As a sequela, tuberculosis is most to be dreaded. Whooping-cough, as is well known, is one of the most potent predisposing causes to tubercle, ranking second to measles in this respect.

The *prognosis* depends to a great extent upon the age and previous health of the child. Normal children above five years of age seldom suffer great inconvenience of serious after-complaints, under proper treatment. The prognosis becomes grave when broncho-pneumonia is added, and in infants (notably rachitic and tuberculous) the prognosis should be guarded.

Diagnosis.—During the prevalence of an epidemic the diagnosis should present no difficulties. Isolated cases, however, may become puzzling, especially when not typical. The character of the cough, together with the accompanying signs described under the symptomatology, should bear one out in differentiating whooping-cough from an ordinary bronchitis. The pertinacity and intensity of the cough, with the absence of all other signs indicating a thoracic condition commensurate with such a cough, is characteristic.

Hyperplasia of the *bronchial glands* frequently provokes a paroxysmal cough, but the course is a chronic one, and there is associated bronchitis, and usually tuberculous foci elsewhere in the chest. Other possibilities for error are found in the so-called “*spasmodic bronchitis*” of infants, and *catarrhal laryngitis* (false croup).

Treatment.—Isolation is difficult to carry out, as the disease is already contagious during a stage at which it cannot always be recognized. Nevertheless, every effort should be made to protect delicate children and infants from exposure by excluding from their presence, during an epidemic, all children with suspicious colds or hacking coughs.

The patient should receive as much air as possible, and in pleasant weather it may be permitted to be out-of-doors. Protracted cases do well from a change of climate, the sea-shore being particularly beneficial.

If the cough is very troublesome at night, and especially in the case of infants in whom asphyxia is to be feared, the

vaporizing of *cresoline* in the sick-room is attended with the happiest results. It is best vaporized by placing it in a shallow dish within another dish containing water, and allowing it to simmer over an alcohol lamp. Holt prefers creasote, vaporized for inhalation in a croup-kettle; formaldehyde vapor is also of service in mitigating the paroxysms.

The *remedies* recommended for whooping-cough are legion, and space forbids enumeration of so long a list. While there are, perhaps, a dozen which are used a hundred times where the others are used but once, it is impossible to tell just what remedy will be of the greatest benefit in a given case before the symptoms have been carefully investigated. The popular feeling as to the clinical value of our remedies in this affection is well presented by the following statistical report by Dr. Geo. B. Peck: * “Out of every thousand prescriptions by members of this Society for the amelioration of that group of morbid phenomena popularly designated whooping-cough, at least 175 are for *drosera*, 153 for *belladonna*, 123 for *ipecacuanha*, 76 for *cuprum (metallicum and aceticum)*, 54 for *corralium rubrum*, 44 for *antimon. et pot. tartaricum*, 24 for *mephitis*, 20 each for *aconitum napellus* and for *hyoscyamus*, 18 for *naphthalin*, 15 for *coccus cacti*, 13 for *kali bichromicum*, 11 for *bryonia*, 9 for *magnesia phosphorica*, 8 for *chelidonium majus*,” etc.

In the early stages *aconite*, *bell.*, *bry.*, *ipecac* or *tartar emet.* may be indicated. As soon as the true nature of the case becomes apparent, a remedy should be given capable of controlling the course of the disease. Opinions differ as to the most potent remedy to accomplish this result. No doubt the remedy will vary with the epidemic, and while *drosera*, *belladonna*, *naphthalin*, etc., are useful in many instances, they are not invariably so.

If, in spite of such a prescription as above recommended,

* “Trans. Amer. Institute of Homœopathy,” 1898.

the case continues to steadily advance or become of a more serious type, *cuprum*, *mephitis*, *corralium rubrum*, *coccus cacti* and *hyoscyamus* should be thought of. Protracted cases will often yield to *carbo veg.* with remarkable promptness.

Ambra grisea.—Hollow, paroxysmal cough, with expectoration of tough, grayish or yellowish mucus, especially after awaking in the morning; belching after cough.

Anacard.—Ill-natured children, with uncontrollable temper; cough brought on by fits of vexation. (*Ant. crud*.—Great irritability; disagreeable toward those of whom it was formerly very fond, frequently striking them.)

Arnica.—Painful paroxysm (boy); tendency to hæmorrhages; meningeal hæmorrhages.

Bell.—Intense redness of face during paroxysm; eyes bloodshot; cough deep and hollow; sneezing after cough.

Carbo veg..—Protracted cases. Follows well after *drosera*. Hoarseness; anæmia; sluggish circulation; flatulent indigestion.

Coccus cacti.—Cough, especially worse in the early morning, followed by the expectoration of yellowish or bloody, tough mucus (*ambra gris*). I have had excellent results with this remedy during the paroxysmal stage, when there was abundant stringy, yellowish expectoration.

Cuprum.—Convulsions; the paroxysms are severe and long-continued, the child becoming blue in the face; cerebral complications (follows well after *ipecac*).

Drosera.—Paroxysmal stage. Worse after midnight; gagging and vomiting predominate; the expectoration is frequently blood-streaked; tuberculous diathesis.

Hyos.—Incessant cough when lying down, relieved from sitting up.

Ipecac.—Spasm of the glottis before paroxysm; the child stiffens out during the cough and becomes blue in the face (a strong indication for *ipecac* in my experience). Broncho-pneumonia, with abundant fine râles; vomiting after cough.

Mephitis.—During the spell the child passes both urine

and fæces; diarrhœa and flatus very offensive; the child must be taken up during the cough, turns blue in the face and seems asphyxiated.

Naphthalin.—Goodno recommends this remedy to be used as soon as the case is recognized. He employs the first decimal trituration.

Tartar emetic.—Broncho-pneumonia. Rattling of mucus in larger tubes; gasping for air; deficient oxygenation of blood.

Sulphur may be required in the third stage, if the patient relapses into his former condition on the slightest provocation.

Phenacetine and *antipyrine* are much used by the old school. Hale recommends *phenacetine* in the 1x trituration, two to ten grains every three to four hours.

Parotitis.

Epidemic parotitis, or *mumps*, is an acute infectious disease in which the parotid glands are attacked by an intense catarrhal inflammation. The specific contagion is not known, but it no doubt gains access into the gland through the duct of Steno, setting up an intense hyperæmia, followed by a profuse serous exudation (soft swelling). The process begins in the ducts and acini of the gland, rarely extending to the interstitial connective tissue, and only terminating in suppuration when there is an accidental infection, with pyogenic micro-organisms accompanying the primary infection. For this reason resolution is perfect in the vast majority of cases, as the tumefaction is the result simply of hyperæmia and œdema, and not of structural changes in the gland.

Secondary parotitis is an affection of the parotid (usually one-sided), with pyogenic micro-organisms, occurring during the course of one of the infectious fevers. It may complicate typhoid fever, diphtheria, scarlet fever, smallpox and measles, rendering the prognosis most grave. In these

cases the submaxillary gland is rarely spared. Contrary to mumps, it terminates in suppuration, the entire parenchyma of the gland being more or less involved in the destructive process.

Mumps appears epidemically, although never to the extent attained by epidemics of the other prominent contagious diseases of childhood. Close contact seems necessary for infection. It is most prevalent during the damp seasons and among those living in damp dwellings. The period of incubation is from two to three weeks. One attack gives immunity against another.

Symptomatology.—For a day or two there may be a slight fever with lassitude, restless sleep, nervous irritability, loss of appetite, etc., preceding the appearance of the characteristic lesion. The inflammation of the gland induces first a painful stiffness of the jaw and tenderness in the region of the parotid. Swelling rapidly sets in, and in the course of a few days the gland will be swollen to its utmost extent. The fever may increase and the sleep become disturbed by restless dreams or delirium; convulsions have been known to occur in young children. The left parotid is the one most frequently attacked first. In the majority of cases the opposite side begins to swell in a day or two from the appearance of the first swelling.

At this time the face presents a ludicrous appearance. The entire parotid region is occupied by a tense, shining swelling which spreads anteriorly to the zygoma and posteriorly to the sterno-cleido-mastoid. The tumor feels firm over its centre while the edges pit on pressure. It is perfectly immovable, as the parotid gland is so firmly held down by the deep fascia as to render its displacement impossible.

The fever now gradually subsides, but the patient is extremely uncomfortable, every effort at opening the mouth being attended with pain, and any article of food not bland in character frequently exciting intense suffering. The

swelling attains its height within three to four days, beginning to subside at the end of a week. This, as has been above stated, is accomplished rapidly and perfectly, and persisting permanent structural changes should lead to a suspicion of a superadded infection (*staphylococci* or *tubercle bacilli*).

Metastases to the testicle in the male and to the ovary or breast in the female are not uncommon in older children at this time, *i.e.*, during the stage of decline, but in young children they are rare. Outside of the possibility of such a complication the *prognosis* is good.

Secondary parotitis occurs during the course of another acute disease, and begins as a hard, painful swelling, more circumscribed than in mumps, with an inflammatory blush soon showing itself over the same. This gradually deepens in color; the swelling becomes more tense, and points of fluctuation can be elicited. In the cases which I have seen the sub-maxillary gland did not escape. If allowed to open spontaneously there is a free discharge of thin, sanious pus. The *prognosis* is always grave, although it is said to be less so when occurring later in the course of the disease which it complicates.

Diagnosis.—It seems unnecessary to call attention to the question of diagnosis in a simple case of mumps, yet errors are frequently made. One of the most frequent is the mistaking of acutely enlarged *post-cervical lymphatics* for mumps; here the slower onset, the multi-locular feel of the tumefaction and its movability will readily distinguish this condition from mumps. *Diphtheria*, with pronounced swelling of the cellular tissue of the neck, has likewise been mistaken for mumps, as I have personally witnessed. The possibility of such an error occurring can only impress us most forcibly with the importance of a routine inspection of the throat in every acute febrile disease of childhood.

Treatment.—The most important remedy is, no doubt, *belladonna*. It corresponds to the vascular engorgement,

the fever, and the nervous irritability so common in mumps.

Mercurius may be indicated early when there is but slight fever, pale swelling of the parotid region and gastric derangement. It is useful in the later stages of all cases to hasten resorption of the exudate.

For metastasis to the testicles *pulsatilla* and *clematis* are the main remedies. If induration with tendency to atrophy follow, *aurum* should be given.

Metastasis to the ovaries calls for *apis*, *pulsatilla*, *lachesis*, *hamamelis*, *sulphur*.

Secondary parotitis finds in *rhus tox.* its most appropriate remedy. As the process continues, *lachesis*, *hepar* or *arsenic* usually becomes indicated. *Calc. sulph.* is the main remedy to promote healing after pus has been discharged either through fistulous openings or by an incision. As soon as the gland becomes swollen, hot fomentations wrung out of a 1 to 4000 bichloride solution should be applied continuously.

This offers a hope of aborting, or at least limiting, the process. In every other respect the case should be managed as one of septicæmia.

Influenza.

Influenza, or *la grippe*, is an infectious disease occurring pandemically and attacking all ages alike. It is characterized by fever, prostration, and either catarrhal manifestations of the respiratory or alimentary tract or disturbance in the nervous system accompanying the general condition. This is the true influenza, and it is to be distinguished from those endemic cases of so-called grippe, catarrhal fever or epidemic bronchitis which occur in children regularly each year, during the fall and winter months.

The *bacillus* of *Pfeiffer* is considered the exciting cause, being found almost in pure culture in the sputum of freshly infected cases. The period of incubation is short, seldom

exceeding more than a few days. One attack does not afford immunity against another, as is the case in many of the epidemic infectious diseases; on the contrary, it may even lead to an increased susceptibility to a fresh attack, or at least to acute catarrhal conditions.

Symptomatology.—The disease begins abruptly with fever, severe headache, general aching and prostration. The fever remains at its height for three to five days, in the absence of complications, during the entire course of which, however, prostration is marked, and the headache and muscular aching usually very distressing. Several clinical types are to be encountered, depending upon the predominance of catarrhal or nervous symptoms and the locality mainly attacked.

Thus, there is the *cerebral form*, characterized by a predominance of headache, together with delirium, and even unconsciousness; the *abdominal form*, characterized by vomiting, anorexia, gastralgia, diarrhœa; the *neuralgic form*, in which there are neuralgic pains in the peripheral nerves and other regions; the *thoracic form*, complicated by broncho-pneumonia, and the *catarrhal form*, the commonest variety, in which catarrh of the upper respiratory tract is the most prominent symptom. Extreme prostration, however, is common to all forms, this being the main feature of the disease. The toxine exerts a most potent influence upon the nervous system, showing itself during the attack in the prostration, cardiac weakness and neuralgic pains, and during convalescence in the persisting prostration and the strong tendency to the development of neurasthenia, perineuritis, insomnia, persistent headaches, and even insanity. Fortunately these complications are not as common in children as in adults, and, taken altogether, the *prognosis* is better, although a complicating broncho-pneumonia may change the entire aspect of the case. As in the case of measles and whooping-cough, tuberculosis is liable to develop after influenza in cases so predisposed.

The *diagnosis* seldom presents difficulty during the prevalence of an epidemic, but isolated cases may be mistaken for a variety of other affections, particularly so in the beginning. The catarrhal symptoms, dry cough and drowsiness, may lead to a suspicion of beginning *measles*, but the subsequent course soon corrects this error. From *pneumonia* it is to be distinguished by the absence of physical signs indicating lung involvement, extreme prostration and a comparatively short course. Cerebral cases may simulate *meningitis* or *cerebro-spinal meningitis*. The mild cases of *grippe* above alluded to present none of the profound toxic manifestations of influenza.

Treatment.—The child should be put to bed immediately, absolute rest enforced, and great care taken to avoid exposure to cold or draughts, in order to ward off serious pulmonary complications.

The diet should be highly nutritious, but easily digestible, to prevent gastro-intestinal complications. When the pulse becomes weak and irregular, a moderate amount of whisky should be administered at regular intervals.

During convalescence much can be done to ward off the many sequelæ belonging to influenza by rebuilding the child's constitution as quickly as possible with appropriate diet, remedies and hygienic measures.

The most important remedies for the average case are *aconite*, *gelsemium* and *bryonia* in the beginning (*gelsemium* and *bry.* frequently suffice for the entire course of the disease), and later we must choose from such an array as *arsenicum*, *euphrasia*, *alium cepa*, *phosphorus*, *kali bichrom.*, *rhus tox.*, *antimon. tart.*, *pulsatilla*, etc., according to the preponderance of disturbances of a certain type or in certain localities.

Arsenicum is indicated where the prostration is extreme and presents the chief manifestation of the disease. This is often seen in infants. There may, however, be sneezing; acrid watery coryza; the process extends to the chest, with cough and dyspnœa; great restlessness.

Bell.—Cerebral cases; starting in sleep; delirium; throbbing headache.

Bry.—Pains in the muscles, every limb aching intensely; lies perfectly quiet and does not wish to be disturbed; dry, painful cough. Broncho-pneumonia complicating influenza (*ant. tart., phosphorus*).

Eupatorium perf.—Deep-seated aching in the back and extremities, as if the bones would break; bilious vomiting.

Gelsemium.—The symptomatology of *gelsemium* presents a true picture of the average case of grippe. The condition begins with lassitude and chilliness, creeps especially up and down the back, and the patient hugs the stove to get warm. He feels prostrated, every portion of the body aches, and he complains of headache, soreness and sensitiveness of the eyes, obstruction of the nose, sore throat, and prostration. The soft rapid pulse, drooping eyelids and flushed appearance of the face are very characteristic of *gelsemium* in this condition. *Baptisia* should be administered if this condition does not promptly improve under *gelsemium*.

Pulsatilla.—Catarrhal symptoms predominate; mild, tearful disposition; the tongue is heavily coated and covered with viscid saliva, but there is no thirst; the patient is constantly chilly; diarrhœa.

Rhus tox.—Aching in the limbs, causing great bodily restlessness; cannot remain quiet in one position; prostration and typhoid symptoms.

Sanguinaria is often indicated when the rhinitis and pharyngitis are intense. There is fluent coryza; dryness of the throat with burning, extending down into the œsophagus; wheezing cough.

During convalescence *china* is a valuable remedy. It rapidly restores the patient's former strength and appetite. Giserius* obtained most satisfactory results from its use, in the first decimal dilution, in several Berlin epidemics.

* Arndt, "Practice of Medicine."

Malaria.

Malaria, or *malarial fever*, represents a group of febrile affections resulting from infection with a micro-organism belonging to the class of protozoa. Each type of malarial fever is traceable to a distinct variety of this micro-organism, possessing its own morphological and biological peculiarities. Thus, there is a specific parasite for tertian intermittent fever, quartan intermittent fever and æstiva-autumnal fever, or tropical malaria. These parasites attack the red blood-corpuscles, in which they live and develop to full maturity and sporulation. With the completion of sporulation a malarial paroxysm is always observed. The tertian organism requires forty-eight hours to undergo a complete developmental cycle; consequently a patient infected by this parasite will experience a paroxysm every third day, *i.e.*, with the occurrence of sporulation. Infection with the quartan parasite results in a paroxysm occurring every fourth day. Double infection with the tertian parasite, each group maturing on separate days, results in daily paroxysms. This is the most frequent type in the acute intermittent fevers in this latitude.—(OSLER.) Quartan fever is extremely rare in this country. Its parasite may also be present in blood at the same time with the tertian parasite. By such combinations most puzzling types of fever are produced.

The mode of entrance of the micro-organism into the blood is still unknown. The disease prevails endemically in certain localities, which are known as malarial regions. Although low, swampy and poorly drained regions, and the banks of sluggish streams are the most frequent localities for malaria, still it unquestionably exists in many of the larger cities, especially in their suburbs and along the river fronts.

The *pathological changes* resulting from malarial infection are intense anæmia, due to destruction of the red corpuscles by the parasite; enlargement of the spleen, which may

lead to hyperplasia of the same; pigmentation in the liver, kidneys and brain. In cases which have resulted fatally there may be intense pulmonary congestion or pneumonia; nephritis; gastro-enteritis. Fortunately, fatal cases are rare, the pernicious form of malarial fever being quite uncommon in this region.

Symptomatology.—A typical malarial paroxysm, consisting of three well-defined stages, namely, chill, fever, and sweat, is seldom seen in children under six years of age. Both the first and third stages may be absent or but poorly defined. Instead of a chill there may be only the signs of a vasomotor spasm, such as blueness of the finger-nails, cyanosis of the face, cold extremities and yawning, or there may be vomiting, diarrhœa and even convulsions preceding the accession of fever. In the course of an hour or less the fever rises rapidly and may attain an alarming height. This condition of hyperpyrexia lasts an hour or two, ending by a gradual fall. Sweat may be entirely absent after the fever. Instead of even this attempt to simulate a malarial paroxysm in the adult, the case may assume more of a remitting type. Holt* observed convulsions ushering in the attack in four instances, and in two-thirds of his cases there was vomiting. Sheffield† reports a series of cases occurring in New York City, the average age of which was ten years, and in one-third of these the chill was absent. Out of twenty cases there were fifteen of the quotidian type, four tertian, one tertian and quotidian (mixed), and one quartan and quotidian.

When there is a complete remission of fever the child may seem entirely well until the second paroxysm makes its appearance. As these attacks return they become more and more atypical, and the condition may go into one of a remittent type of fever. If this continues uninterruptedly,

* "Amer. Jour. of Obstetrics," etc., 1883, and "Diseases of Infancy and Childhood."

† "N. Y. Med. Jour.," Oct. 23, 1897.

grave constitutional symptoms develop, such as prostration heavily coated tongue; abdominal tenderness; slight jaundice. This is frequently called typho-malarial fever, but there are no grounds for supposing such a condition to be dependent upon a mixed infection of the bacillus of typhoid and the parasite of malaria.

Enlargement of the spleen and anæmia are usually well marked, especially if the disease has progressed to any considerable extent. The symptoms accompanying the febrile stage are those common to febrile disturbances in general.

The *prognosis* is usually good. Untreated cases may take one of the following courses: (1) mild cases may go on to spontaneous recovery; (2) the paroxysm may gradually diminish in intensity, but grave anæmia and chronic cachexia develop, or (3) the paroxysm may increase in severity and assume finally a pernicious type.—(THAYER.*)

Masked or Irregular Forms of Malaria and Malarial Cachexia.—Malaria is seen in its masked form more frequently in children than in adults, and a malarial paroxysm may be so atypical, or affect a certain region to such a degree, as to entirely mask the condition, the malarial element only being eventually suspected by the regularity of recurrence of the attack, the association of enlarged spleen and anæmia, and possibly by a history of exposure to malarial infection or residence in a malarial district. Finally, the discovery of the parasite in the blood expels all doubt as to the true nature of the case.

Such disturbances in the nervous system are common. Headache, continuous or recurring; neuralgia in various localities; intermittent spasmodic torticollis, accompanied by a slight rise in temperature and enlarged spleen (HOLT); multiple neuritis. Trigeminal neuralgia is rare in children. Congestion of the lungs, simulating pneumonia, may occur paroxysmally.

* "Amer. Text-Book," Diseases of Children.

Malarial cachexia may develop likewise without malaria having been suspected, either from the attacks being unaccompanied by very high fever, or from presenting themselves in a masked form. The child is markedly anæmic and emaciated, the skin being dry and sallow. The face has a drawn, pinched look, and the eyes are surrounded by dark circles. Indigestion and diarrhœa, irregular febrile movements and enlargement of the spleen are usually present. Here, again, an examination of the blood will corroborate the diagnosis. The prognosis in such cases is not as favorable as in fresh febrile attacks.

Diagnosis.—Malarial infection should always be suspected when a periodic disturbance, accompanied by anæmia and enlargement of the spleen, are encountered. In order to remove all question of doubt, a blood examination should be made. A negative result does not necessarily exclude malaria, as it may require several examinations to obtain positive results.

Anæmia infantum pseudo-leukæmia presents some of the symptoms of malarial cachexia, but the absence of fever, the leucocytosis and absence of the malarial parasite readily differentiate the two conditions.

The remittent form of malarial fever is frequently confounded with such conditions as the *hectic fever of tuberculosis*; *typhoid fever*, and the *septic fever of empyema, pyelitis*, etc. A careful process of exclusion is therefore necessary in order to justify a diagnosis of malaria in many instances. The old school attach great importance to the therapeutic test, *i.e.*, improvement of symptoms upon the administration of quinine.

Treatment.—Little can be done for the patient during a paroxysm to render him comfortable, and fortunately the duration is not long enough to cause material harm. During the intervals and during convalescence a tonic treatment is indicated. Cases simulating typhoid are to be managed on the same general principles as such cases.

Remedies prescribed in malarial fevers are usually divided into three classes: (a) those possessing a specific and abortive influence over the paroxysms, (b) those indicated for general disturbances arising during and complicating the paroxysm, (c) those indicated in the chronic form and for the cachectic manifestations.

To the first class *cinchona* and its alkaloid, *quinine*, belong pre-eminently. We must all admit its specific action in typical cases of malarial fever; and while it is, in general, overestimated and given far too heroically, still it remains an important remedy for the disease. I have, however, become so thoroughly convinced through personal observation, believing with many others that there are cases in which quinine is not indicated, in which it fails to afford relief, and which are promptly cured by the administration of a remedy selected in accordance with the symptoms of the case, that I invariably individualize my cases of intermittent fever just as any other disease.

The true sphere of *cinchona* lies in that class of cases which present each stage well marked, with the absence of any complications or symptoms not directly traceable to the febrile paroxysm. *Chininum sulph.* is supposed to exhibit greater regularity in the time of occurrence of the paroxysm, beside possessing some symptoms not found under *cinchona*. For a fuller description of these remedies and their special indications in intermittent fever I must refer to Allen's *Therapeutics of Intermittent Fever*. As to the dose, that is unfortunately a matter of contention. Kafka* sums up his experience as follows: "Given on exact indications, quinine acts in small as well as in larger doses, only not in infinitesimal doses. While the most beautiful results were attained with the 1x trituration, or even stronger doses of 1 to 2 grains given every two hours during the period of apyrexia, we exerted ourselves in vain with the 2nd, 3rd, etc."

* "Homœopatische Therapie."

Goodno entertains similar views, even recommending a much larger dose in the case of failure by this method. Many authentic cases, however, are on record showing the efficacy of these two remedies in higher potency. Before resorting to the heroic method we should always study up the case carefully in order to verify the correctness of the prescription. I have obtained such astonishing results from *eupatorium perf.*, *nux vomica*, *ippecac*, *natrum mur.* and *lachesis* that I would not feel satisfied to leave them untried, if indications for one of them were present, before resorting to large doses of *quinine*.

Remitting malarial fever will find in *gelsemium*, *baptisia* and *chininum arsenicosum* its leading remedies.

Malarial cachexia is most frequently benefited by *arsenicum*. Other remedies of importance are *lachesis*, *carbo veg.* and *natr. mur.*

Typhoid Fever.

Typhoid fever is an acute infectious continued fever due to the *bacillus* of *Eberth*. This germ is found abundantly in the discharges from the bowels; also in the blood and spleen, and in the urine where there is albuminuria. The anatomical lesions are inflammation of Peyer's patches and of the solitary follicles, with tendency to ulceration and enlargement of the spleen. A macular eruption of rose-colored spots, appearing mainly upon the abdomen, is one of the pathognomonic signs of typhoid fever, but, like ulcerative lesions of the intestines, they are not so constant in children as in adults. The accompanying symptoms are fever of a regular type; prostration and nervous disturbances; more or less diarrhœa and wasting. Here, again, the disease is not as typical as in adults. The fever is of a more remitting type, and of shorter duration. The other symptoms are usually milder, and diarrhœa may only appear in the later stages of the disease.

Infection almost invariably takes place through the alimentary tract by water or milk containing the germs. The

possibility of the germ entering the system through the inspired air and the occurrence of some cases through direct transmission from one patient to another are not to be denied, but such cases are extremely rare. Hensch has seen patients lying beside children with typhoid fever who discharged their stools directly into the bed contract the disease, and similar cases of house infection have been reported from the Children's Hospital in Basel, by Hagenbach-Burckhardt, and others. The degree of contagiousness, however, is so slight that it need not be taken into consideration when any degree of sanitary precaution is exercised.

Typhoid fever is practically unknown under two years. The majority of cases are seen between the ages of six and twelve.

The *pathological lesions* are not so marked as in the adult, as typhoid fever runs a milder course, and is seldom fatal at this age when uncomplicated. The first change observed in the intestines is a catarrhal inflammation of the lower portion of the ilium, together with swelling of the solitary follicles and Peyer's patches in the ilio-cæcal region. The cæcum and colon are moderately involved in the catarrhal inflammation.

As the process continues, round-cell infiltration into the lymphoid structures constituting the swollen follicles and patches takes place, with the formation of elevated plaques and shot-like projections. The amount of infiltration, however, seldom attains that degree observed in the adult, and, instead of necrosis from compression of the blood-vessels supplying the affected area setting in, it usually terminates by fatty degeneration and resorption of the infiltration. For this reason the course is shorter and more benign, and ulceration of the bowels much rarer than in adults. In older children the same lesions are to be found that characterize typhoid fever in the adult. With the breaking down of the infiltrated areas, deep, oval ulcers—their

long axis corresponding to the direction of the bowel—are found. Smaller, irregularly-scattered ulcers result, with the breaking down of the solitary follicles. The slough is more frequently superficial, separating without the production of a deep ulcer, and unattended by the septic fever observed in adults at this stage.

The changes found in other parts are: swelling of the mesenteric glands; swelling of the spleen, which is soft and pulpy; parenchymatous degeneration of the heart, liver and kidneys. Hypostatic pneumonia, bronchitis and broncho-pneumonia are commonly associated with typhoid fever.

Symptomatology.—The onset of typhoid fever is gradual in the majority of cases, being preceded for a day or two by prodromal manifestations, such as general malaise; headache; restless and dream-disturbed sleep; anorexia and constipation. There may be slight chilliness recurring daily for several days, but never a decided initial chill. The temperature now begins to rise in a characteristic manner. Morning remissions are marked, but the fever rapidly reaches its acme, usually in from four to five days; in adults this is not attained until the end of the first week, and there is a gradual step-like rise in the temperature. Cases in which there is a high initial rise of temperature are, according to Filatow,* not to be considered as typical typhoids, but as abortive cases or typhus exanthematicus. However, as Holt points out, the attack may be precipitated by symptoms of acute indigestion, in which case it begins abruptly with high fever. The correctness of this view I have been able to frequently verify. After the acme has been attained, the fever presents a continuous remitting type. The remission occurs in the morning, and the exacerbation in the evening; in severe forms, with high temperature, the remissions are not as marked as in milder

* "Acute Infections," *Krankheiten in Kindesalter*.

cases. Toward the end of the second week (about the twelfth day) the morning remission becomes more pronounced, and soon a lowering in the evening rise is noticed. The temperature now falls by lysis, and in the course of five days or a week the stage of defervescence is completed. Accordingly, a typical, uncomplicated case of moderate severity occurring in a child under ten years old pursues a course of from seventeen to nineteen days. Severe cases, or such in which complications occur, may be indefinitely prolonged beyond this period, or prove fatal; but the course of many cases is undoubtedly shortened by homœopathic treatment.

The symptoms occurring during the first stage are those of fever, accompanied by prostration, gastric derangement and marked indifference. The face is pale, and the cheeks usually flushed; later the countenance wears a characteristic apathetic expression, and assumes a sub-cyanotic color, due to the deficient surface circulation and imperfect aeration of the blood.

The tongue is heavily coated with a light-yellowish fur. This coating wears off in places, exposing the slightly-swollen papillæ as oblong red specks. A red streak down the centre of the tongue is likewise produced by the tongue rubbing against the upper central incisors during its propulsion. Only in severe and prolonged cases does it become brown and cracked. Even when the lips are covered with brown crusts and cracked and bleeding, the tongue is usually more or less moist and light in color. Cracking and bleeding of the lips are common in children, from the great prevalence among them of picking at the same.

The bowels are usually constipated in the beginning, and may become loose as the fever progresses. In cases marked by severe bowel symptoms the stools are thin and watery, often involuntary. The abdomen is prominent, and tenderness and gurgling are found in the right iliac fossa upon pressure.

The eruption is not as constant and is less abundant in young children than in adults; it is found upon the abdomen and lower portion of the chest, developing in crops. The first crop appears about the eighth day, successive crops appearing for a week or longer. The spots consist of small, rose-colored macules, disappearing on pressure. They may spread to the neck and lower extremities, and in serious cases with septic infection petechiæ may develop.

The spleen becomes enlarged early in the disease; in fact, by the end of the first week it can usually be felt extending below the border of the ribs.

The pulse furnishes valuable data for diagnosis early in the disease. Instead of rising progressively with the temperature during the first week of the fever, it remains slow and measured. With the progress of the fever, however, it becomes rapid and feeble. We should, therefore, always suspect enteric fever whenever a febrile condition is encountered in children in association with a relatively slow pulse-rate in its early stages. The opposite condition holds good in meningitis. The dichrotic pulse, so characteristic in the adult, is only observed in older children.

The disturbances in the nervous system are apathy, prostration, and cerebral irritability. The child is often exceedingly cross, and slow in answering questions or obeying requests. Delirium is usually present, especially during the night, and if the child is particularly susceptible to the typhoid poison many symptoms resembling meningitis are developed. Thus, dilated pupils, retraction of the head, twitching of the muscles of the face and extremities, crying out in sleep and stupor are frequently encountered. They disappear with the falling off in the fever. A true cerebrospinal meningitis may complicate typhoid fever in rare instances.

The urine may become albuminous from acute parenchymatous degeneration of the kidneys. The bacillus is usually present in the urine in such cases, which probably accounts for the albuminuria. Actual nephritis is rare.

Beside the rose-spots, sudamina occur upon the skin, especially on the chest and abdomen. They develop toward the end of the disease. At this period profuse and debilitating sweats often occur. Sometimes a critical sweat, with rapid improvement in the general condition of the patient, is observed at the close of the fever.

Bed-sores, boils, phlebitis and abscesses in various parts are seen in septic cases and in the debilitated.

Relapses may be said to occur in about 10 per cent. of cases. They usually occur about a week after the primary attack. I believe they are more prevalent during some epidemics than during others. The relapse is of shorter duration than the primary attack, but there is a return of the old symptom, together with a renewed eruption of spots.

Among the *complications*, bronchitis and broncho-pneumonia stand most prominently. Otitis media, bed-sores, circumscribed suppurative processes, phlebitis and intestinal hæmorrhage are occasionally seen. Fatal hæmorrhages and perforation are rare, as likewise abscess of the lung, empyema, septic parotitis. The last mentioned complications are quite fatal. Other conditions which have been reported are ulceration of the mouth, throat and genitals; pericarditis and endocarditis; peritonitis; suppurative synovitis and osteitis; nephritis; tuberculosis.

Sequelæ in the nervous system are transitory aphasia; multiple neuritis; chorea, and insanity, all fortunately rare.

The *prognosis* is more favorable in children than in adults, but a case should never be considered out of danger until well on the road toward convalescence. Even then a relapse may occur, or an indiscretion in diet result in a renewal of fever and diarrhœa, hæmorrhage, or perforation. In fatal cases there usually exists as a complication pneumonia, septic infection, intestinal hæmorrhage, or perforation. In the fatal cases coming under my notice there was

most frequently a grave, accidental infectious condition, such as septic parotitis, empyema, pulmonary abscess, and phlebitis. Geohegan* reports a fatal case from perforation and hæmorrhage in a child under two and a half years old. Fortunately complications are not common under strict homœopathic treatment.

Diagnosis.—Aside from the pathognomonic symptoms of typhoid fever, viz., continued fever of a definite type; rose-colored spots; tympanitis, with gurgling and tenderness in the right iliac fossa; enlarged spleen and pea-soup stools, there is at our command the blood-test of Widal and the urinary test (diazo-reaction) of Ehrlich. Unfortunately the former is difficult to carry out, requiring special laboratory facilities and expert technique in bacteriology. Widal's test consists of the introduction of a few drops of blood from a patient suffering from typhoid fever into a pure culture of typhoid bacilli. A microscopical examination reveals an immediate formation of heaps consisting of the agglutinated bacilli, which have also lost their motility. The reaction is one of immunity, indicating that a toxic substance has been formed in the blood-serum which is capable of destroying the motility of the germs causing the disease, and also inducing their agglutination. Johnson† advocated the use of dried-blood specimens as more expedient, and this method is now largely employed. By simply redissolving the dried blood, which has been collected upon a piece of sterilized paper, with a few drops of water, and adding this solution to an equal quantity of a young bouillon culture of typhoid fever, the same reaction is obtained. The reaction may already be observed on the fourth day of the disease, but it is frequently delayed to the end of the first week. It continues throughout the fever, and may persist for some time after recovery. The frequently-re-

* "Typhoid Fever in Infancy and Early Childhood," Trans. Amer. Institute of Hom., 1897.

† "Amer. Public Health Ass.," 1896.

corded negative results should not weigh heavily against this most valuable diagnostic adjuvant, as faulty technique is probably more to be blamed than the test itself in these cases.

The *diazo-reaction* is also a valuable test to corroborate the diagnosis, but this reaction is also obtained in acute miliary tuberculosis and rapidly progressing pulmonary tuberculosis. I have been able to obtain it in the majority of my cases. The diazo-reaction is a rose-red color imparted to the urine by the addition of ammonia after the urine has been treated with sulphanilic acid and sodium nitrite. It is present from the middle of the first week until the end of the fever period; the presence of nephritis interferes with its action.—(WHITTAKER.*)

Another aid in the diagnosis of typhoid fever in children is the presence of an epidemic. Cases occurring sporadically are often difficult to recognize.

From *malarial fever* it is to be differentiated by means of a blood examination to ascertain the presence or absence of the malarial parasite, and by the temperature curve.

Meningitis.—A strong point of difference between meningitis and typhoid fever is the behavior of the pulse. In typhoid fever it is relatively slow in the beginning, becoming rapid toward the end of the disease; in meningitis the pulse rises proportionately with the fever in the beginning, but becomes slow and irregular toward the close of the case. Furthermore, in meningitis the abdomen is retracted; the bowels are constipated throughout, and true paralyses are to be observed.

Acute miliary tuberculosis cannot be differentiated from typhoid fever in the absence of rose-spots and the Widal reaction on the one hand, and positive localized tuberculous lesions on the other. If the case progresses to a fatal termination without the slightest benefit having been de-

* "Diagnosis of Obscure Cases of Typhoid Fever," N. Y. Med. Jour., Jan. 14, 1899.

rived from treatment, and especially when pulmonary disturbances were marked, it is undoubtedly one of miliary tuberculosis.

Treatment.—The patient should be put to bed at once in a room which can be freely ventilated, and from which all unnecessary furniture and draperies have been removed, not on account of any degree of contagiousness on the part of the fever, but simply to give as much air-space as possible. Provisions must at once be made for the disinfection of the stools and urine, which can be accomplished by the use of any active germicide. A strong solution of chloride of lime, Platt's chlorides, or carbolic acid (5 per cent. solution) is to be poured over the stools as soon as they are passed, and allowed to act upon them for several hours before being emptied into the water-closet. All towels, napkins and sheets soiled by the patient should be boiled, to render them sterile.

The *diet* is of the greatest importance. Owing to the intestinal lesions, solid food must be withheld until at least a week after disappearance of the fever, diarrhœa and abdominal tenderness. Where abdominal symptoms have been marked during the fever, it is better to wait even longer before resuming solid food. It is needless to say that a return to such a diet must be made gradually, beginning with such articles as thoroughly boiled cereals; poached eggs; milk toast; the soft portion of a baked apple, etc.

Although milk is looked upon as an ideal liquid food, it does not act as such in many cases, and, when given unmodified, passes away in firm curds. The stool should therefore always be watched when administering milk, as such curds may induce most unfavorable symptoms. In young children it is always best to dilute the milk with barley-water, or administer it partly digested.

Strained vegetable soup, made from mutton and various fresh vegetables, is a most valuable food, and an agreeable

change to the patient. Likewise grape juice, when diarrhoea is not marked; and any of the reliable proprietary foods, such as Horlick's malted milk, Eskay's food, and Mellin's food (the latter, when there is constipation), are all of value. The mistake, however, is to feed the patient without any degree of regularity or restriction as to quantity, and changing from one article to another promiscuously. The best results are obtained by selecting the food best adapted to the case, and administering 3 to 4 ounces every three hours; once or twice daily, one of the other articles mentioned may be substituted for the sake of variety. The patient should also receive water freely.

The child must be sponged daily with tepid water and alcohol (one to three), and when the fever runs high, remaining above 103° F., during the greater period of the twenty-four-hour range, these baths must be repeated every two to three hours. Should this fail, a cold pack may be tried. Hyperpyrexia calls for a graduated cold bath.

The routine treatment by baths is not to be advised. Although it has a great many advocates, and unquestionably yields results far superior to the crude drug treatment employed by the old school, as they themselves admit, still it is not entirely without danger, beside being troublesome to carry out, and it is in no way the equal of the homœopathic treatment. We cannot, however, dispense with the above measures entirely, but our remedies exert such a specific action over the fever that we need seldom resort to more than simple sponging.

Stimulants may be necessary in the later stages of the fever if cardiac weakness becomes pronounced. In cases requiring stimulation there is usually also continuous delirium of the low muttering variety; dry, trembling tongue; tympanites and pronounced adynamia, and I might even say, lack of reaction to remedies. Many of our remedies act prominently in a stimulating way, but we meet cases in which the system fails to respond to them until reac-

tion has been brought on by physiological means. Small doses of whisky, given at regular intervals in water or in milk, should be administered when the above condition obtains.

The leading typhoid fever remedies are *baptisia*, *bryonia*, *gelsem.* and *rhus tox.*, and in certain epidemics one of these remedies will be indicated in almost every case. It should be continued throughout the entire course of the disease unless the most positive indications for a change of remedy present themselves; even in such an event it is wise to return to the first remedy when the intercurrent has corrected the symptoms for which it was chosen. Thus, in many epidemics *bryonia* will be found the chief remedy, and although indications for *hyoscyamus*, *phosphoric acid*, or some other remedy of a similar sphere of action may arise during the progress of the case, a return to *bryonia* should be made as soon as these symptoms have been controlled. It is not at all rare to find cases running a short and uncomplicated course receiving but a single remedy during the entire period, providing the remedy has been carefully selected. In a disease like typhoid fever, which we may anticipate to assume a most grave aspect at any moment, we must prescribe with caution and precision from the very beginning, and only change the remedy after mature deliberation. As to repetition of the dose, it has been my experience, in common with that of many others, that the best results are obtained from a frequent administration of the remedy when symptoms are urgent, lengthening the intervals as soon as improvement is noted.

The following indications embrace the most important symptoms of the leading remedies at our command:

Agaricus.—In typhoid fever where the nervous symptoms predominate. Low fever, tremulous tongue, and general tremor of the entire body. (Progressive heart failure in drunkards with typhoid fever.)

Apis.—Remitting type of fever. Chilliness in afternoon

with oppression of breathing; heat without thirst; later unconsciousness with involuntary stools; dry tongue, which is cracked and covered with aphthæ, difficult to protrude, difficult deglutition; scanty urine; muttering delirium.

Arnica.—General stupefaction of the senses; general soreness, bed feels too hard; the sleep is disturbed by anxious dreams; the tongue is red and dry, with a brown streak down the centre; putrid taste in mouth; fetor ex ore; involuntary discharge of fæces and urine; the extremities become cold while the head remains hot; hæmorrhages and bed-sores develop.

Arsenicum.—Low types of typhoid, usually the later stages in unfavorable cases. Farrington cautions against the early use of *arsenic* in typhoid fever, and considers it a remedy capable of doing absolute harm unless clearly indicated. It is most useful in the young or aged, or those debilitated by previous ailments. The general symptoms so characteristic of *arsenic*, such as great restlessness, prostration; thirst for small quantities of water; hot, dry skin; general aggravation of all symptoms soon after midnight or noon; cadaverous smell of the discharges as well as of the patient—are all prominent indications for its use. “Its true place is there, where rotten, putrid and cadaverous stools and dry, wooden tongue indicate a degree of disintegration of the vital fluids which *rhus* no longer can check.”—(JAHR.) It should not be given before *rhus tox*.

Baptisia.—The well-known mental symptom, the hallucination that the body is dismembered, that certain parts of the body are double, or that there is a second self in the bed with the patient, is a strong indication for *baptisia*, although its absence by no means deprives this drug of its usefulness in typhoid fever. *Phosphorus* and *petroleum* both have similar symptoms. The condition calling for *baptisia* is characterized by great weariness and a bruised feeling of all the limbs, together with a low type of fever and physical prostration; offensive diarrhœa; breath, sweat

and urine are alike offensive; there is dull, stupefying headache; the patient is delirious, sleeps heavily and is aroused with difficulty. The tongue is dry and brown, the conjunctivæ injected, the face flushed, with a besotted expression; exhaustion is marked. *Baptisia* may be indicated early in the disease when the symptoms are intense from the beginning, excluding such remedies as *bryonia* and *gelsemium*.

Bryonia.—*Bryonia* may be indicated at any stage, although its most frequent application will occur during the first stage. The symptoms calling for its selection are very characteristic and prominent—irritability, lassitude, desire to remain quiet and sleep; headache, worse from opening the eyes or moving the head; dryness of the lips, mouth and throat, with thirst for large quantities of water; aching of the limbs, worse from motion; frequent brown, putrid, loose stools; delirium at night and restless sleep, disturbed by dreams of daily affairs; wants to go home; visions when closing the eyes.

Carbo veg.—*Carbo vegetabilis* is indicated in extreme cases. It has been well said, “The *carbo vegetabilis* patient is dying,” and although many a life is saved by the timely application of this remedy, cases are nevertheless critical in which it brings on reaction and gives the organism another chance to rally. The picture is a familiar one—progressive stupor; lustreless eyes, with sluggish pupils; Hippocratic countenance; parched tongue; distended abdomen; involuntary diarrhœa; hæmorrhages from the nose, mouth or intestinal tract; cold extremities, the coldness gradually extending from the feet up to the knees; small, frequent pulse, at times imperceptible; decubitus. The *carbo vegetabilis* patient is passive, the *arsenicum* patient active in his decline.

Gelsemium.—In the early stages *gelsemium* is frequently indicated on the symptoms of lassitude, drowsiness, dull headache, with heaviness of the eyelids and photophobia; slow, intermitting pulse, accelerated from slight exertion; blueness of the lips; chilliness up and down the spine;

epistaxis; catarrhal conditions of the eyes and respiratory tract; diarrhœa.

Hamamelis.—Hæmorrhages of dark, fluid blood from the bowels, with great soreness of the abdomen.

Hyoscyamus.—The delirium indicating *hyoscyamus* is characterized by loquacity, obscene actions, or even attempts at violence. The patient picks at the bedclothes and grasps at flocks in the air, with continual muttering. *Stramonium* is similar, but the loquacity is confined to one subject and the patient is more noisy, often crying out in terror from supposed visions of horrible animals, bugs, and the like, which he sees coming out of the floor, crawling along the ceiling, etc. The automatic movements of the extremities occurring during the delirium are also characteristic in both drugs; in *hyoscyamus* they are angular and jerky, in *stramonium* gracefully executed in gyratory motions. *Hyoscyamus* also has total loss of consciousness, with dry tongue, involuntary stools, subsultus tendinum, dribbling of urine.

Lachesis.—The *lachesis* patient is also loquacious, but he jumps from one subject to another in an incoherent manner; there is stupor, dropping of the lower jaw, dry, red or blackish tongue, which is red at the tip and bleeding, and trembles on being protruded; the stools are horribly offensive, the abdomen sensitive to touch, and all symptoms are more intense after sleep. The fever is highest in the afternoon, the patient is restless, the surface of the body is cyanotic, and a sense of suffocation about the throat overcomes him on falling asleep.

Mercurius.—The characteristic nocturnal aggravation, the greenish-yellow stools, broad, flabby tongue and drowsiness may indicate *mercurius*, especially when there is hepatic disturbance in connection with the case.

Muriatic acid.—Low types of typhoid fever, in which the patient is stupid, sliding down to the foot of the bed; the tongue is parched and dry, difficult to protrude; stools

involuntary while passing urine; loud moaning during sleep, and when awake not fully conscious to his surroundings.

Nitric acid.—Deep ulceration of the bowels, with hæmorrhages and great sensitiveness of abdomen in the region of the cæcum, and intermittent pulse. Also hypostatic pneumonia; brownish, bloody expectoration; rattling cough; “too weak to talk.”

Opium.—Either complete loss of consciousness, with loud, stertorous breathing, contracted pupils, face dark red and bloated or pale and deathlike expression; dropping of the lower jaw; hot sweat; or delirium, with sleeplessness due to hyperæsthesia of the special senses, so that slight noises keep him awake.

Phosphoric acid.—Low typhoid state, in which the patient becomes totally indifferent to his surroundings. He can be aroused, but with difficulty, and soon relapses into his apathetic condition. There is great debility; rattling of mucus in the chest; rumbling in the abdomen; tympanites; grayish, watery stools; bleeding from the nose; red streak through the centre of the tongue; milky urine; clammy skin.

Rhus tox.—After *bryonia* and *gelsemium*, *rhus toxicodendron* and *baptisia* frequently follow. The provings of *rhus tox.* present a typical typhoid state, and the anatomical changes in the intestines closely correspond to the lesions of typhoid fever. The symptoms are sharp and well defined, as in the case of *bryonia*. The mind becomes beclouded and the mental operations are performed with difficulty; the patient is restless, from a distressing aching in every limb, and constantly changes his position to gain relief (not as in *arnica*, where there is soreness induced by lying in one particular attitude, which makes him seek a new position). The sleep is restless, disturbed by dreams of great physical exertion. The lips are brown and dry and the teeth are covered with sordes; the tongue is likewise brown and dry, presenting

a triangular red tip. The diarrhœa is worse during the night, often involuntary during sleep. Beside this, there may be bronchitis; hypostatic pneumonia, with bloody expectoration; bleeding from the nose, and labial herpes.

Stramonium.—The *stramonium* stool is blackish and horribly offensive; the delirium noisy, and has been fully described under *hyoscyamus*. Suppression of urine during typhoid fever is a prominent symptom.

Sulphuric acid.—Protracted cases, especially in children with aphthous stomatitis, stools like chopped eggs and very foetid; hæmorrhages, with rapid sinking of the vital forces; desire for stimulants. Similar to *phosphoric acid*, but more intense.

Sulphur.—This remedy is often useful when other prescriptions have not yielded the desired results in the case. The lack of reaction is a strong indication for *sulphur*, although its symptomatology furnishes ample instances pointing to its applicability in typhoid fever. Where the cardinal symptoms are retarded, the course protracted, and the type complicated, *sulphur* will be indicated at some time or another.

Veratrum viride.—*Veratrum viride* is indicated where there is furious delirium; full, tense pulse, later becoming soft and irregular; red streak down the centre of the tongue; pneumonic complications. *Tartar emetic* may likewise be called for where there is dyspnœa, cyanosis, rattling of mucus in the bronchial tubes, subcrepitant râles, and œdema of the lungs.

Zincum.—Abolition of all reflex excitability. Trembling of the hands, constant motion of the feet and lower extremities, cessation of diarrhœa, Hippocratic countenance, subsultus tendinum.

Diphtheria.

Diphtheria is an acute, infectious, highly-contagious disease due to a specific micro-organism. While diphtheritic inflammations of mucous membranes may result from other

micro-organisms—notably from the *streptococcus pyogenes*—the term “diphtheria” should be restricted to those cases of pseudo-membranous pharyngitis and laryngitis due to the specific diphtheria germ. The other condition, described as *pseudo-diphtheria*, embraces those anginas complicating scarlet fever, measles, and occasionally others of the infectious diseases, or occurring primarily as “diphtheritic sore throat”—being due to impaction with the streptococcus. The appearance of the membrane and the accompanying symptoms differs greatly in the two conditions, so that a differential diagnosis can usually be made upon a clinical examination alone; but it must be remembered that a double infection is quite a common occurrence, such cases, in fact, being as frequently encountered as the pure form of Klebs-Löffler diphtheria. Here the case partakes of the characteristics of both conditions, complicating the course, as well as influencing the treatment, to a considerable degree.

Membranous croup is that form of diphtheria in which primary infection takes place in the larynx with the development of a diphtheritic membrane, which may either remain confined to the larynx or spread up or down, involving the larynx and trachea secondarily.

Faucial diphtheria frequently invades the larynx secondarily, the resulting laryngeal symptoms being identical with those of a fully-developed case of croup; but the clinical picture presented by a case of primary croup differs so markedly from the manifestations of faucial diphtheria that its description, like that of pseudo-diphtheria, must be considered separately.

The *Klebs-Löffler bacillus* is a micro-organism varying greatly in size, being broad, straight or slightly curved, and presenting a club-like extremity. They contain highly-refractile, oval bodies, which take the stain more deeply than the bacillus itself, the best stain being an alkaline methyl blue.

The bacillus is spread by the discharges from the mouth, throat and nose, and may persist for a long time in the throat of a patient after recovery. Infection may take place either directly from the patient, or indirectly through the medium of articles of bedding, clothing, toys, etc. It may also be spread through the agency of a third person. It must, however, be remembered that a child with a perfectly healthy throat is not liable to contract the disease, a catarrhal angina, with slight superficial erosions of the mucous membrane, enlarged tonsils, naso-pharyngeal catarrh and catarrhal laryngitis, as well as the scrofulous diathesis which furnishes most of these requisites, being the strong predisposing causes.

Pathology.—Pathologically considered, a diphtheritic inflammation presents a pseudo-membrane, which is inseparably attached to the deeper layers of the mucous membrane upon which it forms, the entire mucosa having undergone a process of coagulation necrosis, accompanied by the exudation of fibrin. Such a condition is rarely met with, however, in Klebs-Löffler diphtheria of the fauces and larynx, a croupous exudation of varying thickness, separating without leaving a deeply-lacerated surface, being the pathological process usually encountered. The true diphtheritic process, resulting in ulceration and sloughing, is more likely to take place in scarlatinal pseudo-diphtheria (septic angina), or in cases of septic diphtheria where mixed infection exists.

The membrane consists of a dense network of fibrin, containing in its meshes pus-cells, dead epithelial cells and numerous micro-organisms. The Klebs-Löffler bacillus can be demonstrated in the upper and outer layers of the membrane. The mucous membrane underlying and adjacent to the pseudo-membrane is found in inflammatory reaction, though rarely œdematously swollen unless pyogenic micro-organisms are plentifully admixed with the bacillus.

The lymphatic glands of the neck are markedly swollen,

but do not tend to break down. When the process is confined to the larynx they may not be involved at all.

Parenchymatous degeneration of the heart, kidneys and liver are the changes observed in the internal organs. A secondary broncho-pneumonia (inhalation pneumonia) is rarely absent in severe and fatal cases. Here the Klebs-Löffler bacillus is usually found in the lungs. Out of 62 cases of broncho-pneumonia, associated with diphtheria, reported by Pearce,* the bacillus was present in 52 instances, being the only organism present in 17 cases. The streptococcus pyogenes was also prominently present. The changes occurring in the nervous system, which became manifest at a somewhat later period, are parenchymatous degeneration of the myelin sheath of the nerves, affecting both motor and sensory fibres alike (BATTEN†), and degenerative changes in the gray matter of the cord, cerebellum and brain.

Symptomatology.—A typical case of pure diphtheria infection presents the following characteristics: The child will usually complain for a day or two of sore throat, which may not attract special attention until fever, offensive breath, prostration and swelling of the glands at the angle of the jaw become apparent. An examination of the throat at this stage of the disease reveals a deposit of false membrane, usually upon one of the tonsils, together with slight swelling of the same and redness of the mucous membrane. This may, however, be slight, in consideration of the serious nature of the condition, and in fact the mucous membrane in some instances will appear pale rather than congested. Likewise the pain on swallowing may be so inconsiderable as to attract little or no attention.

The membrane is of a grayish or yellowish-gray color, and firmly adherent to the subjacent mucous membrane; in fact, it is impossible to remove the same by means of a

* "Jour. Bost. Soc. Med. Sciences," June, 1897.

† "British Med. Jour.," Nov., 1898.

probe. This is a pathognomonic sign of diphtheria, and taken in conjunction with the swollen lymphatics, the offensive breath and the moderate degree of fever, a diagnosis of true diphtheria can usually be made without difficulty, as a bacteriological examination will subsequently verify. Instead of beginning as a single patch, there are perhaps more frequently seen isolated dead-white spots of varying size upon one of the tonsils, which may remain discrete throughout the entire course, if the disease does not assume a severe type. Usually, however, they unite into one large, irregular patch, and the opposite tonsil, from being brought in contact with the affected one during deglutition, soon develops a similar membrane.

In severe cases the membrane spreads rapidly from its periphery, travelling along the margin of the soft palate, covering the uvula, which becomes elongated and swollen, and finally invading the opposite half arch and coalescing with the membranous deposit of the other tonsil. It also spreads posteriorly to the pharynx, whence it may invade the posterior nares or the larynx.

In a steadily progressing case the above distribution of the membrane will have been completed in about three to four days from the time of onset. At this time the membrane can be studied in various stages of development. At the site of origin it will be found to have attained considerable thickness, being of a pearly or dirty grayish color, with a well-defined border and slightly projecting edge in one direction, while in another it fades out into a thin, grayish film, which is invading new territory. This film likewise thickens and assumes the same color as the other portions of the membrane, which now shows a tendency to become darker and dirty-looking.

By the fifth or sixth day the process has reached its acme, and in the course of three or four days the membrane begins to separate spontaneously, providing the patient has not succumbed to the disease. A red areola of reactionary

inflammation is seen about its border, and it gradually loosens and comes away in pieces, leaving behind a reddened, slightly swollen and readily bleeding mucous membrane. Coincident with these changes the constitutional symptoms rapidly improve, and the patient is on the road to convalescence.

The symptoms accompanying the diphtheritic process are those of a most grave toxæmia. As pronounced symptoms do not develop to any considerable degree until the disease has well progressed, they are seldom of diagnostic value. The child complains of lassitude, anorexia and sore throat; repeated chilly sensations and headache may also be present. Fever is usually not high in the beginning, and may remain at a comparatively low point throughout the entire course, fluctuating between 101° to 103° F. An abrupt onset, however, with high fever, headache, severe pain in the throat and considerable swelling of the tonsils may take place. In such cases I believe the early symptoms to be due to the streptococcus, as the primary patches generally assume the appearance seen in pseudo-diphtheria, being of a yellowish color and more friable than in the other forms. But as the membrane spreads it partakes of the features of true diphtheria, reaching out over the soft palate and pharynx in a thin, grayish film, which later becomes dense and leathery. Simultaneously the lymphatic glands become markedly swollen, prostration is profound, and the case assumes a grave aspect.

The pulse becomes rapid and weak during the later stages, the heart being affected to a marked degree by the toxins of diphtheria. Sudden death may take place from cardiac paralysis during the height of the disease, or it may not occur until the child is convalescing, following upon some incautious physical exertion. The myocardium, as well as the innervation of the heart, is affected by the toxic process.

The tongue is coated from the beginning and the breath

characteristically offensive. The bowels are generally constipated. Albuminuria is found in many cases; it usually clears up promptly, simply indicating acute degeneration of the kidneys as a result of the elimination of toxines.

Diphtheritic paralysis occurs more frequently in adults than in young children, being seldom seen under two years. The severity of the case does not necessarily indicate the amount of paralysis which is to be expected, for cases with but a small amount of membrane may be followed by considerable paralysis, and *vice versa*. The condition partakes of a multiple neuritis, the pathological changes in the nerves having been described above. Symptoms may occur while the membrane is still present, but this is unusual. In the majority of cases they do not occur until two or three weeks after recovery. Paralysis of the soft palate is the first symptom, manifesting itself by nasal voice, regurgitation of food through the nares, and difficulty in swallowing.

The eye-muscles are frequently affected early, and loss of accommodation, strabismus and ptosis are the disturbances encountered here. When the extremities take part in the paralysis, the patient will complain of muscular weakness, with tingling and numbness, gradually increasing in severity until he is, perhaps, unable to walk or use the arms, although complete paralysis is rare. When the extremities become involved, the paralysis is symmetrical. Sensation is markedly impaired, and the knee-jerk lost, even at times without the existence of paralysis. The prognosis as to ultimate recovery is good, although the course is variable, some cases continuing for several months before improvement sets in.

Extension of the membrane to the nose is indicated by nasal obstruction with an acrid, offensive, muco-purulent discharge, and increased swelling of the lymphatic glands at the angle of the jaw, together with involvement of the submaxillary glands. Owing to the large absorbing surface

brought in contact with the toxines, constitutional symptoms are markedly aggravated, and prostration becomes extreme.

Extension into the larynx is indicated by progressively increasing dyspnœa, cyanosis, and a croupy cough. The process may result in complete stenosis of the larynx, with death from suffocation.

Septic diphtheria is characterized by the addition of sepsis to the diphtheritic condition. The symptoms are due to septic infection, which is both local and general. The throat assumes a dirty grayish color, or even blackish where blood extravasation into the false membrane takes place, and a cadaverous stench emanates from the mouth. A tenacious brownish mucus covers the tongue and lips, and an acrid discharge runs from the nostrils. The lips are dry, swollen and cracked, and may be covered with patches of false membrane. Swelling of the lymphatics at the angle of the jaw is pronounced, and is accompanied by infiltration of the cellular tissue of the neck. The pulse is rapid and feeble, the extremities become cold, and prostration is profound. The temperature fluctuates greatly, and in a given case may fluctuate from subnormal to a high degree. Septic cases are usually rapidly fatal, succumbing to the toxæmia rather than to laryngeal involvement.

Laryngeal Diphtheria or *Membranous Croup* is a primary infection of the larynx characterized by the formation of a false membrane (croupous exudate) upon the laryngeal mucous membrane. The false membrane may remain confined to the larynx, or extend down into the trachea and up into the pharynx. Often it is accompanied by a tonsillar exudation. Laryngeal diphtheria presents few of the characteristic symptoms of faucial diphtheria for several reasons. Owing to the feeble absorptive power of the mucous membrane lining the larynx, glandular enlargement does not take place, and as constitutional symptoms are delayed for the same reason, they are not frequently observed,

owing either to the rapidly fatal course of the disease or to a checking of the process before symptoms have had time to develop. Goodno states that the fatal cases of primary pseudo-membranous laryngitis under his care which were subjected to tracheotomy, and lived long enough to develop constitutional symptoms, died as diphtheria patients die.

The onset is insidious, with moderate fever, croupy cough, and hoarseness. During the first few days symptoms are slight and only point to a catarrhal laryngitis, nocturnal aggravations frequently occurring from spasm of the vocal cords. When, however, an exudate is seen upon the tonsils, or down in the pharynx, we are able to immediately suspect the true nature of the case. At the end of three or four days laryngeal obstruction becomes apparent. The voice is hoarse or entirely lost; during inspiration a harsh, tubular sound (stridulous respiration) is heard, and the act is accompanied by retraction of the supra-clavicular and intercostal spaces and the lower border of the thorax. The child usually sits erect, and every effort at inspiration is laboriously performed, all of the accessory respiratory muscles being thrown into action. With progressing stenosis the body surface becomes cold and cyanotic, and the child becomes drowsy and later comatose, dying from asphyxia. Death may result in a few days from the time of onset, although the course is usually somewhat longer. With the intervention of surgical measures (intubation and tracheotomy) the case presents a less unfavorable prognosis.

Pseudo-diphtheria differs from true bacillary diphtheria both etiologically and symptomatically. Such a diphtheritic process may develop independently or complicate scarlatina, measles, etc. As a complication of scarlatina it appears, however, more frequently and more gravely than in any other form. In this disease an angina of almost any grade of severity seems possible, the virus of scarlatina exerting direct and specific influence upon the throat, and

permitting of the development of the gravest forms of diphtheritic inflammations.

The *streptococcus pyogenes* is the germ most frequently found in pseudo-diphtheria, as was first demonstrated by Prudden. Although other micrococci, notably the *staphylococcus aureus* and *albus*, are sometimes found alone in these cases, or in association with the streptococcus, they play a less important rôle than the latter, which is capable of producing the most violent manifestations. The observations of Filatow* fully confirm this fact, and he is led to the belief that all "scarlatinal-diphtherias" are streptococcus anginas; furthermore, pseudo-diphtheritic streptococcus-angina may be encountered as an independent disease, occurring without scarlet fever. Holt states that from 25 to 35 per cent. of cases formerly sent to hospitals with a clinical diagnosis of diphtheria were really cases of pseudo-diphtheria.

Vierordt† found in a series of diphtheroid anginas both streptococci and staphylococci, and in one case a diplococcus. The Klebs-Löffler bacillus was present in none of these cases. The membrane did not extend to the nose or pharynx, but in the greater number it passed beyond the tonsils in the direction of the soft palate. Boullouche‡ divides the various pseudo-diphtheritic anginas into the following classes: *streptococcus-angina*, *staphylococcus-angina* and *pneumococcus-angina*. He considers them non-contagious and usually mild in their course.

Although these bacteria are found in conjunction with the bacillus in most cases of true diphtheria, they do not modify the course of the disease unless present in large numbers, and even then it is only the streptococcus which materially alters the nature of the case, the bacillus-streptococcus combination being the most unfavorable form of infection producing septic diphtheria.

* "Acute Infections," *Krankheiten*.

† "Berliner Klin. Wochenschr.," 1897, No. xxxiv.

‡ "Les Angines à Fausses Membranes."

The *clinical course* of pseudo-diphtheria is quite different from bacillary diphtheria. It is only in cases of mixed infection that a clinical differentiation becomes difficult or impossible. In pseudo-diphtheria there is pronounced inflammation of the pharynx and tonsils, with redness, swelling and pain. It begins abruptly, with high fever, lassitude and headache. Soon small, white or yellowish patches are seen to develop upon the tonsils; they become darker in color and may coalesce, but seldom spread beyond the tonsils. The membrane is more friable than that of true diphtheria, and can usually be detached without much difficulty.

Swelling of the lymphatics seldom takes place. Such cases run a comparatively short course—from four to five days—and although constitutional symptoms are severe during the height of the disease, the throat symptoms being particularly distressing, they are never dangerous in character, and sequelæ need not be feared. Paralysis never follows pseudo-diphtheria, nor is extension to the larynx to be feared, although in the severer cases which complicate scarlatina extension to the nose and Eustachian tubes frequently takes place.

Scarlatinal pseudo-diphtheria may become a very serious condition. Beside the extension of the membrane just alluded to, sloughing and ulceration may occur, with general septic infection, and cellulitis of the neck and suppuration of the lymphatics. Such cases are very fatal, being only equalled in virulence by septic diphtheria, from which they can scarcely be separated. The membrane develops during the height of the fever in the majority of cases, but it may be seen before the eruption appears. A diphtheritic sore throat developing after the fever has abated, or during convalescence, is more likely of bacillary origin.

Prognosis.—In forming a prognosis in a given case of diphtheria several factors are to be taken into consideration. In the first place, we must exclude pseudo-diphtheria, which in its primary form offers a good prognosis; in its second-

ary form the prognosis is less favorable, and must be determined in a similar manner applying to bacillary diphtheria.

The age is of importance, as diphtheria is uniformly more fatal in infants than in older children. Adults present the best chances, but they are more subject to paralytic sequelæ.

The character of the epidemic is also of importance, and a knowledge of the source of infection. But this is not always reliable, for a most virulent diphtheria may originate from an apparently mild diphtheritic sore throat, and *vice versa*.

The appearance and distribution of the membrane offers valuable suggestions for a prognosis, but here again errors are liable to occur. Extensive membranous deposit may exist with but slight constitutional disturbances, and scanty membrane may be accompanied by grave toxæmia. Neither can we foretell when laryngeal involvement, with rapidly-developing stenosis, will occur.

The patient's general condition is, therefore, the safest guide in determining his chances for recovery. So long as the pulse remains good and prostration is not marked the case should not be despaired of, as there is a chance of checking the process, or at least carrying the patient over the period when the membrane becomes self-limited in its progress, providing it shows no tendency to invade the nose or larynx. Nasal and laryngeal diphtheria are about equally grave, although the nasal type is somewhat slower in its course. Septic cases are practically out of our reach. Other unfavorable symptoms are epistaxis and hæmorrhages into the subcutaneous tissues; nephritis; marked prostration and cardiac weakness; cervical cellulitis.

In *croup* the prognosis is more favorable than in secondary laryngeal diphtheria, owing to the absence of septic symptoms.

During convalescence there is danger of paralysis of the heart. This may appear as progressively increasing heart weakness, or occur suddenly upon some physical exertion.

Broncho-pneumonia occurring with diphtheria is very unfavorable; when complicating croup the case is practically hopeless, as intubation or tracheotomy becomes useless in such cases.

Diagnosis.—There is only one safe means of escaping the error of allowing a case of diphtheria to run its course unrecognized until so far advanced as to make itself self-apparent, and that is to examine the throat of every child presented for treatment in an acute condition, as a matter of routine. The importance of such practice is only realized when we recall how trivial the throat symptoms may be in the beginning of diphtheria, particularly in a child not able to express itself or understand its sufferings properly.

The differential diagnosis rests mainly between *pseudo-diphtheria* and *follicular tonsillitis*. *Pseudo-diphtheria* is abrupt in onset; lymphatic swelling is absent in primary cases; fever is high, and the throat is markedly reddened and swollen, and there is considerable pain on swallowing; secondary cases occur during the febrile period of scarlet fever. Paralysis never follows, and although septic symptoms are present the specific toxic symptoms of diphtheria are absent. The membrane is thinner, can be removed without bleeding, and is usually of a yellowish color, later becoming dirty.

In *follicular tonsillitis* both tonsils are uniformly swollen and covered with small, round, white spots, which are not adherent to the mucous membrane, but consist of plugs of exudation filling up the lacunæ of the tonsils, from which they can be readily expressed and wiped off.

Membranous croup is to be differentiated from *acute catarrhal laryngitis*. (See p. 147.)

Lastly, it may be said that no diagnosis is complete without a bacteriological examination, for a case which may appear clinically of minor importance may harbor germs of a most virulent nature. The differentiation of pseudo-diphtheria from true diphtheria becomes also of the great-

est importance in the matter of isolation, particularly in the detention of patients suffering from the former disease in isolating wards harboring true diphtheria.

Treatment.—Isolation and sick-room hygiene are to be carried out on the same plan as recommended under *Scarlatina*, p. 395. Children who have been exposed to diphtheria should have their throats examined several times daily, and be instructed to use a gargle of *permanganate of potash* (1 to 1000) three or four times daily. Immunizing doses of *antitoxin* are highly recommended by many pædiatrists, affording protection against diphtheria for several weeks.

The *diet* must be of a most concentrated and nutritious form, and stimulation is of the greatest importance as soon as the toxic influence of the diphtheria virus upon the heart and nervous system becomes apparent. A teaspoonful of whisky well diluted with water or milk, and administered every two hours, suffices for the average case; but where there is much prostration and failing heart, the quantity must be increased accordingly. Absolute rest is to be enjoined during convalescence, as well as during the disease, in all cases showing cardiac weakness, in order to avert a possible sudden death.

As to *local treatment*, it can be positively stated that all measures in any way giving the patient pain or discomfort and requiring physical restraint, or resulting in injury to the mucous membrane of the throat, will accomplish nothing excepting to do harm. In infants a spray of *permanganate of potash* (1 to 1000) given, by means of an atomizer, every two or three hours, and in older children a gargle similarly employed, have yielded the best results in my hands. Should the child be too weak to gargle, a teaspoonful of the solution may be given internally every two hours. Alcohol, diluted with four or five parts of water, is also an excellent gargle, but not as active as the *permanganate*.

In *nasal diphtheria* our aim should be to keep the nasal

chambers as open and free from secretion as possible. A douche of *permanganate*, 1 to 2000, or a 2 per cent. solution of *boric acid*, should be given about three times daily, as directed on page 459.

In *laryngeal diphtheria* an emetic will give temporary relief when suffocation becomes imminent, but intubation or tracheotomy should not be put off until so late a period. Although still a matter of dispute, intubation seems the preferable procedure in the majority of cases. It should always be attempted first, and, in the event of not offering the most desirable results, tracheotomy can be resorted to as a *dernier ressort*. In all forms of diphtheria, but especially in croup, it is essential to keep the air of the room moist and at a temperature of about 70° F., or slightly higher, if this be practicable. The air must, at the same time, be kept as rich in oxygen as possible. The spraying about the sick room of hydrogen dioxid, or the slacking of lime, is an excellent means of purifying the air.

It is by no means easy to say just what the most important remedies are in diphtheria, as no attempts at differentiation have been made in the past between pseudo- and true diphtheria, and the errors which so frequently beset the diagnosis of membranous croup render it difficult to estimate the exact value of the treatment which was employed.

The *mercuries*, especially the *cyanide*, the *bichloride* and *red iodide*; the *bichromate* and *permanganate of potash*; the *chloride of lime*; *hydrochloric* and *nitric acid*; *lachesis*, *arsenic* and *arum triphyllum* are most closely related to the bacillary variety. *Merc. cyan.* and *kali bich.*, especially where there is extension to the larynx; *arum triph.* in the nasal variety, and *arsenic*, *lach.*, *chloride of lime* and *hydrochlor. acid* in septic cases.

The high-grade inflammatory symptoms of pseudo-diphtheria call for remedies like *apis*, *belladonna*, *ailanthus*, *phytolacca* and *rhus tox.*

Mild diphtheritic anginas yield rapidly to the *mercuries*,

ignatia, *bell.* and *apis*. The *red iodide* attacks the left tonsil by preference, while the *yellow iodide* is indicated when the right side is involved. *Ignatia* is almost a specific in those anginas in which there are small white spots on the tonsils, with a feeling of a lump in the throat, relieved by swallowing. There are also sharp pains shooting up into the ears, and slight glandular involvement. In *belladonna* there is more fever and headache, the throat is dry and glistening red, and there is considerable pain in swallowing and a sense of constriction. *Apis* presents more of an œdematous condition, the swelling being paler in color and the pains of a stinging character, worse on swallowing.

The most efficient remedies in croup are *bromine*, *iodium*, *kali bichromicum*, *liquor calcis chlorinata* and *hepar*. The symptoms of *spongia* are more purely catarrhal and spasmodic than croupous. *Bromine* 3x has given me the best results, and has apparently checked the process promptly, keeping the disease at a stationary point for a day or two, after which time all symptoms gradually disappeared. Dunham's* experience with Bœnninghausen's method of prescribing *aconite*, *hepar* and *spongia* in rotation seems to have been of the happiest kind. Neidhard obtained good results from his *liq. calcis chlorinata* in croup as well as in faucial diphtheria, but he frequently alternated with *potassium bichromate* in the former condition.

The routine treatment advised by Heysinger† is of great value in all cases of pseudo-diphtheria and in diphtheria with septic symptoms. He administers a teaspoonful of a solution of *permanganate of potash*, one grain dissolved in 2½ to 3 ounces of water every one to two hours, according to circumstances, in alternation with a teaspoonful of *belladonna*, 5 minims of the tincture in 3 ounces of water. The *belladonna* relieves the fever and hyperæmia; but where symptoms are purely toxic it is of no value, and a remedy

* "The Science of Therapeutics."

† "Journ. of Ophthal., Otol. and Laryngol.," January, 1892.

must be chosen symptomatically (*merc. cyanat.*, *arsenic*, *hydrochlor. acid*, *lachesis* and others).

The symptoms upon which the remedies applicable to diphtheria and croup have been most frequently presented are the following :

Acetic acid.—Croup, attended by bright redness of the face. From five to ten drops of acetic acid in a half tumblerful of water with some sugar; a teaspoonful every two to three hours.—(C. G. R.)

Ailanthus.—Scarlatinal diphtheria with livid and swollen throat. Deep ulcers on tonsils; the patient gradually sinks into a stupor.

Ammon. carb..—Nasal obstruction and carbonization of the blood; extreme prostration.

Apis mel..—Edematous swelling of the fauces, cellular tissue of neck and of the glottis. Burning and stinging pains in throat; albuminuria.

Arsen..—In the later stages, especially in toxic cases with marked cardiac weakness; albuminuria; irregular fever; extreme restlessness.

Arum triph..—Acrid discharge from the nose excoriating the upper lip; an acrid fluid oozes from the mouth which causes the lips to become sore and swollen. The child constantly picks at the lips and nose, keeping them in a bleeding condition. There is burning pain in the throat, and the breath is very offensive. The membrane spreads up into the nares (*Vinca minor*).

Bell..—Early, especially in cases beginning abruptly with pronounced throat symptoms and fever.

Bromium.—Croup. Suits best to fair, chubby children, and in cases with little or no fever. *Iodium* is recommended in brunettes and in the presence of fever.

Calc. chlor..—The *liquor calcis chlorinata* was first recommended by Dr. Neidhard* in diphtheria and croup, and it

* "Diphtheria, Its Nature and Homœopathic Treatment," 1867.

is still a favorite remedy with many practitioners. He employed five to fifteen drops of the *liquor* in half a tumbler of water, giving a teaspoonful every fifteen minutes in urgent cases, or only at intervals of several hours in more favorable ones. His success was apparently most gratifying.

Hepar.—Croup. The cough is hard and metallic, with a loose edge; although the child may expectorate, the obstruction is not relieved. Croup developing after exposure to a cold wind.

Kali bichr.—Croup. Tough, stringy discharge from throat, with hoarseness and croupy cough. Also nasal diphtheria with a similar discharge from nose; extension up into the Eustachian tube.

Lachesis.—Diphtheria beginning on left side. The symptoms are intense, although the throat lesion is apparently slight (toxic cases). The membrane is grayish or becomes black, and is surrounded by a purplish areola; the cellular tissue of the neck is infiltrated and the skin presents a livid hue. Hyperæsthesia about the throat is a most characteristic symptom, and the patient must have all garments as loose as possible in this region. Aggravation of symptoms after sleep is another characteristic of *lachesis*.

Lycopodium has been recommended for diphtheria beginning on the right side (*merc. jod. flav.*). There is irritability, especially after sleep; obstruction of the nose; aggravation of symptoms in the afternoon, between 4 and 8 P.M.; throat symptoms worse from taking warm drinks.

Merc. cyanatus.—Adynamic cases with abundant membrane displaying a tendency to travel down into the larynx. “Adynamic fever and collapse already in the commencement.”—(VON VILLERS.) According to Allen it is also of service in nasal cases with profuse debilitating sweat from the slightest exertion. The *cyanide of mercury* is undoubtedly a truly homœopathic remedy to toxic diphtheria, producing the extreme adynamia observed in these cases and

gangrene of the velum palati and fauces.—(BECK.) Of late the old school has been making use of it, a series of 81 cases of diphtheria with but one death being reported by Luddeckens-Leignitz.* He also uses it in scarlet fever, whether complicated by membranous angina or not. The usual dose was a teaspoonful of a 1 to 10,000 solution every hour. Von Villers and others observed the best results when using the higher potencies (6th to 30th).

Merc. jod. ruber.—Membrane begins on left side; painful swelling of lymphatics; the tonsils are swollen and the palate elongated; the patches are irregular in outline and of a dirty yellowish color; tongue heavily coated and flabby; salivation. The *yellow iodide* affects the right side and partakes more of the general characteristics of *mercury*, while the *red iodide* displays more of the action of *iodine*.

Muriatic acid.—Great debility, as in typhoid fever. The tongue is red and dry; the membrane is brown or blackish; epistaxis; sordes on the teeth; dry, scab-covered lips; diarrhœa.

Phytolacca.—Much pain and swelling in the throat. The mucous membrane is of a bluish-red color and is covered with grayish ulcers.

Rhus tox.—The throat appears as if varnished, and of a deep red color. Swelling of the lymphatics and cellular tissue of the neck is marked. There is great restlessness and prostration, with aching in every joint. Septic cases.

Post-diphtheritic paralysis.—The most useful remedies are *gelsemium*, *causticum*, *cocculus* and *nux vom.* *Strychnine* is extensively used by the old school, but many of its best authorities are in doubt as to any specific influence exerted by it over the condition, relying more on a general tonic treatment and galvanism.

Serum therapy.—The antidotal treatment of diphtheria,

* "Aerztliche Rundschau," 1896, No. vi.

accomplished by the hypodermatic injection of the blood-serum of horses, previously immunized to the toxins of diphtheria by being subjected to progressively increasing doses of the same, has furnished us with one of the most valuable means of combating this much dreaded disease. Not only is the serum, popularly known as *antitoxin serum*, capable of antidoting the systemic disturbances belonging to diphtheria, but it also exerts a specific influence upon the local manifestations. Furthermore, it has been conclusively demonstrated that an artificial immunity against the disease can be obtained from a comparatively small dose. This, however, is of a transient nature, only persisting over a few weeks, but it nevertheless indicates the strong antagonism which exists between the serum and the toxin. The overwhelming evidence in favor of this form of treatment in diphtheria, based on statistics coming from both Europe and America, and from private practice as well as from large hospitals for contagious diseases, should lead all clinicians to give it a fair and convincing trial. When we consider that diphtheria is purely a toxic condition, requiring antidotal treatment as well as any other case of poisoning, be it a snake bite, lead- or opium-poisoning, we should gladly take advantage of such a promising remedy, and by using it in conjunction with judicious local measures and remedies chosen on indications requiring special consideration, we may hope to still further lower the death-rate so materially changed within the last few years.

The sphere and scope of antitoxin must not be carelessly passed by, for it has its limitations and characteristic indications, as well as any other remedial agent of positive value. Again, the limit of its action is to antidote the toxins circulating in the blood and check the local process; it has no curative effect beyond this, which is simply the creation of an artificial immunity. Upon the parenchymatous changes in the heart, kidneys and liver, and the

specific changes in the nervous system, it has not the slightest influence. Consequently its efficacy becomes less and less positive as the disease is allowed to progress without efforts to check it, and the occurrence of diphtheritic paralysis cannot be avoided in a system which has once been saturated with the toxins, even if antitoxin be used in such a case with otherwise favorable results. In pseudo-diphtheria and septic cases it is absolutely useless. The use of antitoxin in such cases has given it many a black eye, if I may use such a term. If a serum is at all to be used in such cases, it must be one capable of neutralizing streptococcus toxins. A slight admixture of streptococci cannot be said to contraindicate the employment of antitoxin, as the bacillus produces the most important disturbances in these cases; but if there is considerable angina, fever, headache and other symptoms of a similar nature, the best results are obtained by using the *belladonna* and *permanganate of potash* combination, for example, in conjunction with the antitoxin.

A perfect case for antitoxin is one in which the bacillus is found in practically pure culture in the throat and the symptoms correspond to the description of a typical case of uncomplicated diphtheria as described above, in which the onset is more or less gradual; fever inconsiderable; pronounced swelling of the throat, and a typical membrane, beside glandular swelling and prostration. Membranous croup of purely bacillary origin is also most positively benefited by it. As pseudo-membranous laryngitis only exceptionally results from other than diphtheritic infection, the exceptions being those rare cases accompanying malignant scarlatina, it possesses in antitoxin a remedy for which we should indeed be thankful.

According to the report of the collective investigation of the American Pædiatric Society,* the mortality among

* "New York Medical Record," May 15, 1897.

cases of laryngeal diphtheria operated upon was reduced to 27.24 per cent., early statistics of intubation in pre-antitoxin days showing only 27 per cent. recovery. The number of cases requiring operation was also greatly reduced, being 39 per cent. with the use of antitoxin, and about 90 per cent. without it. In a former report it was shown that the average mortality from faucial diphtheria in private practice was about 12 per cent., but among the cases which received antitoxin within the first three days it was only 7.3 per cent. Baginsky treated 82 consecutive cases with antitoxin at the Friedrich's Hospital, in Berlin, with a mortality of 12.2 per cent. Immediately following this series, 103 cases were treated without antitoxin, and the mortality rose to 53.4 per cent. After this, antitoxin was resumed, and out of 124 cases only 11.3 per cent. died. Clubbe* reported a parallel series of 300 cases of diphtheria, treated with and without antitoxin, at the Sydney Children's Hospital. The diagnosis was confirmed bacteriologically in all cases. Of those treated without the serum, 52.7 per cent. died; 199 required tracheotomy, with a mortality of 67.8 per cent. The mortality was reduced to 20 per cent. by the employment of serum injections, and among this series only 129 required tracheotomy, with a mortality of 37.9 per cent. Statistics could be multiplied, but as they all practically indicate the same beneficial results from the antitoxic treatment, especially in laryngeal diphtheria, the foregoing will serve as sufficient evidence in its favor.

Accurate rules for dosage cannot be laid down for each case, but the following plan will be a safe one to adopt as a working basis, modifying it according to the needs of individual cases. In all cases seen before the third day, an injection of 1000 units should at once be administered, unless the case be one of unusual severity, or of the laryngeal type, in which 2000 units must be used. If within twelve to

* "British Medical Journal," Oct., 1897.

eighteen hours there is no improvement in the child's condition, a second injection is to be given, repeating the thousand units in faucial cases if there is only a standstill in the condition, or increasing it to two thousand units should the case be progressing unfavorably (laryngeal or nasal involvement). A third injection of 2000 units may be required in laryngeal cases if there is still no improvement in twenty-four hours after the second one; but this is rarely the case, and is only possible when the patient has been successfully intubated or tracheotomized.

In children under two years of age the dose should not exceed 1500 units in the severer cases, 1000 usually being sufficient even in laryngeal diphtheria. In mild cases which are seen early, 600 units are the maximum dose required. In order to obtain the best results it must be used early and in sufficient potency to neutralize the toxins in the blood, repeating the dose if the action of the first does not yield the desired results after a reasonable length of time. The mode of injection is simple. A site at which the skin is loose and not highly sensitive (preferably the region of the shoulder-blade) is cleansed preparatory to the injection, the child is laid on its side without arousing undue suspicions by allowing it to see the syringe, and the injection is made in the usual manner. Since the improvements in the preparation of serum have given us the same in a highly concentrated form, the necessity for employing an especially large syringe is done away with. However, it is well to have a special hypodermic syringe (one of 5 c.c. capacity) for this purpose, in order to insure of its being in readiness at all times. The needle should be boiled before inserting it under the skin, and the barrel of the syringe cleansed with an antiseptic solution before and after using. By carrying out a perfectly aseptic technique and employing a concentrated form of serum—one in which the preservative is not carbolic acid—the many local and general disturbances attributed to antitoxin will be avoided.

The effect of the serum upon the local and constitutional manifestations of the disease are noteworthy. Repeated examinations of the throat will indicate that the membrane has ceased to spread, it becomes paler and cleaner in appearance, and at the end of twenty-four hours begins to loosen and shrivel. Within forty-eight hours an extensive membrane may have almost entirely disappeared, leaving behind only small fragments of the more firmly attached portions. Laryngeal stenosis is sometimes relieved sufficiently within a few hours to render intubation unnecessary. Nasal obstruction is relieved in a similar manner. As regards the constitutional symptoms, there is a rapid change from a condition of a serious illness to a comparatively slight one. However, as said before, antitoxin does not prevent sequelæ, nor does it undo the mischief which has resulted from the action of the toxins upon the organs and tissues of the body. For this reason it is always wise to combine constitutional treatment with the antidotal treatment, with the object of counteracting these pathological processes and preventing sequelæ as far as possible.

Glandular Fever.

This disease was first described by Pfeiffer,* and his observations have since been verified by both Continental and American observers.

The *etiology* is still obscure, but it is undoubtedly infectious, as it usually occurs in house-epidemics. West† reported an epidemic of ninety-six cases as having occurred in eastern Ohio. It is most frequently seen between the ages of two and eight, and in the fall and winter months.—(FILATOW.)

The onset is abrupt, as a rule, the temperature reaching 103° F., or over. The child complains of loss of appetite, difficulty in swallowing, and pain on attempting to move

* "Jahrbuch für Kinderheilk., Band. xxix., 1889.

† "Archives of Pædiatrics," Dec., 1896.

the head from side to side. The bowels are constipated, and vomiting may be present. In conjunction with these symptoms there is coryza, injection of the mucous membrane of the throat, and slight difficulty in swallowing. The pathognomonic symptom is swelling of the glands of the neck, those situated just behind the point of origin of the sterno-cleido-mastoid muscle being, most prominently enlarged. They are painful to the touch, and by careful palpation we can make out the nodular character of the swelling, pointing to the involvement of a series of individual glands. This condition, in conjunction with the movability of the swelling, offers a ready distinction between glandular fever and mumps.

The fever may last for only a few days, or it may be prolonged to eight or ten days. In such cases enlargement of the spleen and liver, scanty urine, and even albuminuria, may be observed. The swelling does not terminate in suppuration, but it may persist for some time after the fever has abated. I have seen it last for a month, with, however, gradual restoration to normal in every respect.

The *prognosis* is good. The *diagnosis* may require differentiation from *acute simple adenitis*, *mumps*, and *diphtheria*. The resemblance between the last two conditions is purely superficial, but they should be thought of as a precautionary measure.

The chief remedies are *belladonna* and *mercurius*.

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